JUNE, 1947

Railway Engineering and Maintenance

NIGHT AND DAY LABOR SAVERS

Reliance Hy-Pressure Hy-Crome Spring Washers on rail-joint bolts are on the job 24 hours a day, extending the interval between maintenance periods and reducing costs. When a heavy freight pounds along, or a fast express whizzes by over a rail joint, the powerful reactive pressure of Reliance Hy-Pressure Spring Washers is at work offsetting the effects of wear and bolt elongation resulting from stresses and strains developed by heavy wheel loads and high speeds. Round the clock, keep rail joints *tighter—longer* with Reliance Hy-Pressure Hy-Crome Spring Washers.

Edgemark of Quality

Reliance HY-PRESSURE HY-CROME *spring washers*

RELIANCE DIVISION
Offices and plant: MASSILLON, OHIO

Sales Offices: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

EATON
EATON MANUFACTURING COMPANY

A "low" hook fits rail-bound frogs; a "high" hook the cast type. High hooks can quickly and easily be hammered down to fit low-flange frogs.

Where TWO PLATES *are better than one*

Bethlehem's Twin Hook Frog Plates are used in pairs, never as single units. The reason is that each plate is equipped with a big, strong, forged hook and any mating pair can be used at several *different* tie positions. Thus you don't have to stock a large and confusing variety of special plates, one for every position.

But there are other advantages, too. The integral forged hooks are larger and stronger than ordinary spike heads. They lessen pull on the spikes themselves; help prevent tie destruction. Moreover, they'll stand a vicious lateral thrust, and they hold hard against lifting.

Another thing you'll like is the way the twin plates fit ties. They do not protrude over the edges of standard ties; hence there is nothing to hinder the smooth, even tamping of ballast.

Twin Hook Frog Plates are an old, established accessory, used in quantity by some of the country's greatest railroads. If you haven't investigated their possibilities, ask a Bethlehem man to tell you about them. He'll be glad to give you the full story.

Standard Twin Hook Plates are made in 23-, 27-, and 31-in. lengths.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast
Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation

Export Distributor:
Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM TWIN HOOK FROG PLATES

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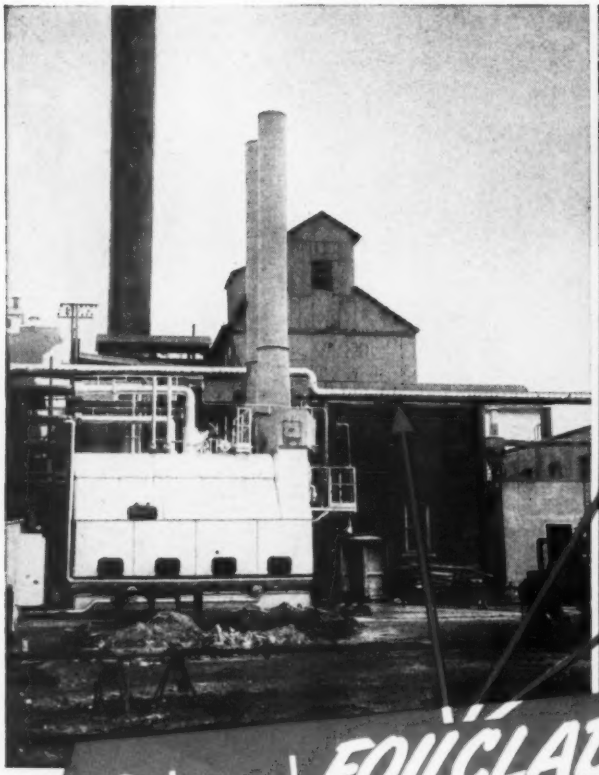
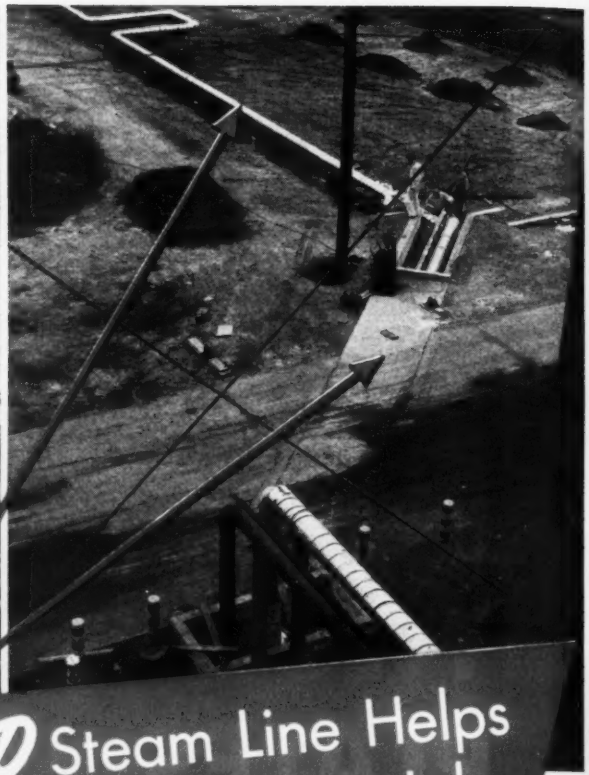




3-Level FOILCLAD Steam Line Helps Commercial Solvents Do a 4-Way Job

Steam for These Important Uses at CSC's Research Center is Distributed at 125 psi in 8 inch SBS Pipe in Ric-wiL Prefabricated, Pre-insulated, Aluminum Foilclad Pipe Units:

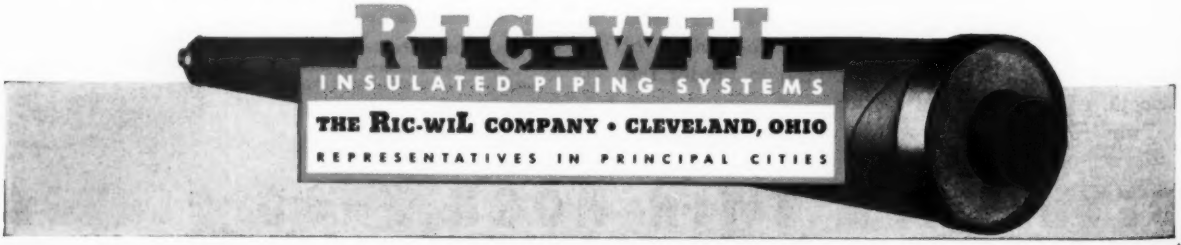
1. General Purpose Building Heating
2. Autoclaves and Sterilizers
3. Sterilization of Process Equipment in Microbiological Pilot Plant
4. Operation of Steam Ejectors

For complete information on the construction and the many advantages of Ric-wiL Foilclad Insulated Piping, write: The Ric-wiL Company, Dept. 13K.

Chemicals of vital importance to American farming, industry, transportation and medical science are produced in wide variety at the nine great plants of Commercial Solvents Corporation. Key operation in these enterprises is CSC's Research Department in Terre Haute, Indiana, for the development of new products and new manufacturing processes, and the improvement of existing processes.

A large scale operation of utmost importance, the very nature of these activities requires the widespread use of large quantities of insulated piping of high thermal efficiency and proved dependability.

A recent installation of Ric-wiL Aluminum Foilclad Piping at this research center is a typical demonstration of the ability of Ric-wiL factory-prefabricated insulated pipe units to meet the special requirements of chemical plants, petroleum refineries, railroads and similar industrial operations. To meet specific project conditions this Unibestos-insulated, asphalt-coated and aluminum-protected 8" steam line in standard 21 foot units was installed on three levels —in a tunnel under a roadway, on concrete piers at surface level, and suspended overhead.

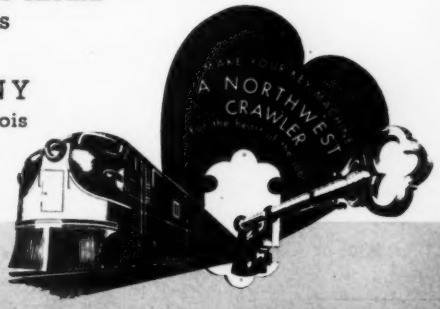


NORTHWESTS make them easy and make them cost less. Your machine isn't confined to tracks. It works anywhere on or off the line. Drainage work is as easy as setting rail.

Your Northwest gets to the job easily too. Load it on a standard flatcar or a drop-end gondola or put it over the highway on a trailer. No need to tie up a line of track and Northwest steering negotiates difficult going. The larger Northwests are equipped with positive traction when turning as well as when going straight ahead—a feature that takes them where other crawlers have difficulty.

Ease of operation is assured by the "Feather-Touch" Clutch Control without complications imposed by pumps, tubing, refills and valves. Your Northwest will be safer on the line for it can't be shut down because of control failure. These are just a few of the advantages that make the Northwest a real Railroad machine. There should be a Northwest on every section of your line. It calls for planning ahead. Why not ask for details?

NORTHWEST ENGINEERING COMPANY
1513 Field Bldg. • 135 South LaSalle St. • Chicago 3, Illinois



NORTHWEST

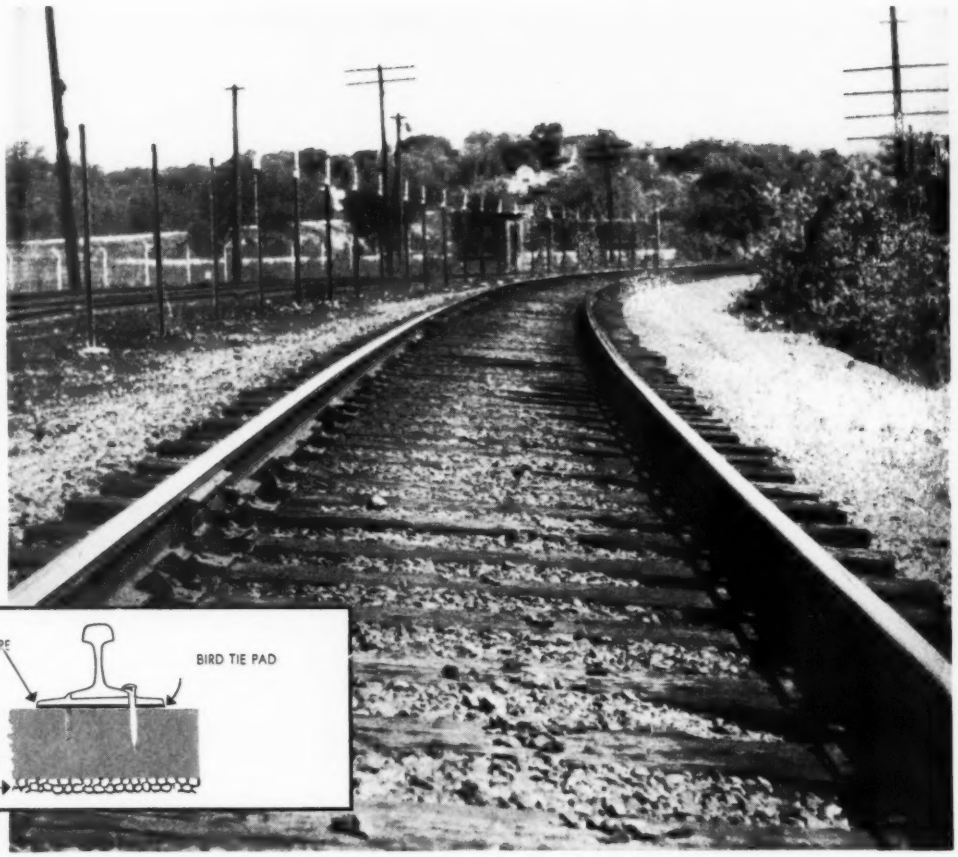
THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL

CUT LABOR COSTS

for gauge, line and surface with Bird Tie Pads

Since the installation of Bird Tie Pads on this tough 6°30' curve in 1946, the section foreman reports gauge, line, and surface are holding for the first time in history, and requiring only a minimum of maintenance work.

Before the installation of Bird Tie Pads it had always required work on gauge, line, or surface every few weeks. Also, the ballast is staying in the cribs instead of fanning out from the low side.



• Other things being equal, Bird Tie Pads help considerably in holding gauge. The preservation of dry, sound, spike hole wood and elimination of uneven plate cutting clearly remove two causes of gauge loss. Cushioning of lateral impacts may also be a factor in preventing loss of spike position.

As our larger tie pad installations of more recent years . . . several miles and more in length, and in varied locations . . . have built up enough time in track to show what they will do, reports are coming in that they produce a major improvement in holding line and surface and give a noticeably better ride. The pads apparently cushion impacts and damp vibration sufficiently so that ties displace or disintegrate their supporting ballast less quickly than they otherwise would.

We do not yet know just how large savings will be . . . but here are a few clues: with lining and surfacing costs running over $400 per mile per year, and track supervisors estimating labor savings as high as 40%, the amount of savings will be substantial. Savings on gauge, line, and surface are in addition to savings from tie life extension and the use of smaller plates. Tie life extension alone not only covers cost of the tie pad, but also gives an additional net saving in the order of 20% of the tie costs . . . more on expensive bridge and switch ties and in fast wearing locations such as sharp curvature. For further details, write us today . . . Bird & Son, inc., 38 Birch St., East Walpole, Mass.

BIRD TIE PADS

East Walpole BIRD & SON inc *Massachusetts*

For additional information, use postcard, pages 609-610

Welding a freight car under-frame before placing it on trucks.

Simplify Your Electrode Stocking Problem, Reduce Your Welding Costs

Do 90% of your welding with P&H "PF" and "DH2" electrodes

These 2 multi-purpose electrodes can speed up your maintenance and car-building programs. Chances for error are eliminated. No special procedures are required. Ample stocks are easy to maintain.

"PF" (Class E-6012) makes easy work of welding irregular and poor-fit-up joints — it solidifies rapidly. Also use this versatile electrode for good results on sheet metal and on mild steel whenever high tensile strength is desired.

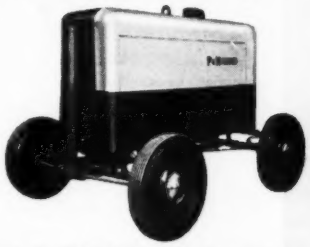
"DH2" (Class E-6020) is fast on heavy plate. Deposits 1½ pounds more metal per hour. Produces X-ray perfect welds. Makes possible easy slag removal and medium or deep penetration.

For special welding jobs on-hard-to-weld steels, call for P&H 70LA (Class E-7015) — it's an all-position, low-hydrogen electrode that produces trouble-free welds of high tensile strength. P&H also offers: A complete line of hard-surfacing electrodes with Rockwell C hardness from 40 to 63. Electrodes for welding high-carbon, alloy, or stainless steels. Nicast electrodes for making machinable welds on cast iron without the need of preheating.

Standardizing on P&H electrodes keeps your welding costs down. Consult a P&H railroad welding specialist or write us for information.

WSR 500 DC Welder
60 to 500 amps.

WN-300 Gasoline-Engine Driven Welder 30 to 375 amps.



Additional P&H Railroad Equipment

Truck Cranes

Excavators

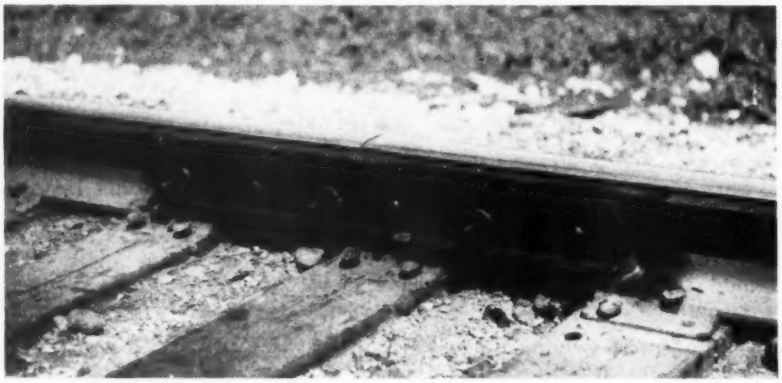
Electric Overhead Traveling Cranes and Hoists

2040

P&H RAILROAD SALES DIVISION
4420 W. National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

HOW TO
Protect Rail Joints
FROM CORROSION

1 For best results, rail ends should first be thoroughly cleaned. Flame cleaning or power wire brushing, as illustrated above, will effectively remove all mill or rust scale.



2 Using a stubby brush, NO-OX-ID "A Special" is applied to rail ends and joint bar bearing surfaces. Brushing well insures lasting results. Coating bolts is also recommended.

3 The completely protected rail joint, with corrosion-resistant and lubrication properties of NO-OX-ID "A Special" sealed in with NO-OX-ID Joint Bar Filler, a tough, plastic plug for the ends of joint bars. Keeps out brine, abrasives, and moisture.

An official three-year test has shown NO-OX-ID "A Special" to have outstanding qualities as a lubricant and rust preventive. The nondrying coating not only prevents "freezing," but stops metal loss and underfilm corrosion as well. Chemical inhibitors add much to effectiveness of NO-OX-ID. Investigate this low-cost rail joint protection, today.

Dearborn
Reg. U. S. Pat. Off.

THE LEADER IN RUST PREVENTIVES AND BOILER WATER TREATMENT

DEARBORN CHEMICAL COMPANY

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For additional information, use postcard, pages 609-610

Black & Decker QUALITY in the SANDER

Cuts Surfacing Costs on Your Jobs!

1 *Full-power B&D-built universal motor.*

2 *A perfectly balanced tool; easy for operator to control for light or heavy work.*

3 *Heat-treated, spiral beveled gears, match-lapped for smoothness, spline-mounted for strength.*

4 *Commutator, bearings and switch sealed against abrasive dust or dirt from the work.*

5 *All ball-bearings on steel inserts and grease-sealed for longer life. Needle roller bearing at back end of spindle.*

6 *Patented spindle lock for speed and ease in changing accessories.*

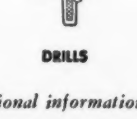
Speedy, powerful Black & Decker Portable Electric Sanders will save you time, labor and money . . . whether you use them for fast, rough sanding; satin-smooth finishing; grinding down welds; removing rust; semi-finishing lumber; or doing 100-and-1 other jobs! Thousands of users are sold on their fine engineering, longer-wearing parts and husky construction. Check their job-tested features at the left. Remember: The work you get out of Sanders depends on *what's built into them!*

Versatile B&D Sanders drive abrasive discs, "Whirlwind" Wire Cup Brushes, saucer grinding wheels and rotary gouging and planing heads. You have your choice of three models: 7″ Standard ($67); 7″ Heavy-Duty ($76); 9″ Heavy-Duty ($92). Ask your nearby Black & Decker Distributor for a free demonstration. Write for detailed catalog of over 100 cost-cutting Portable Electric Tools to: The Black & Decker Mfg. Co., 663 Pennsylvania Avenue, Towson 4, Maryland.

LEADING DISTRIBUTORS EVERYWHERE SELL

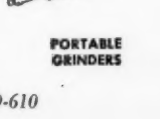
Black & Decker

PORTABLE ELECTRIC TOOLS



DRILLS

BENCH GRINDERS



PORTABLE GRINDERS

SAWS

THIS DISASTROUS Fire COULD *have been* PREVENTED!

A buckled rail caused by the burning timbers below.

The LIBBEY-ZONE TREATMENT *would have saved this bridge!*

From main line to shunting trestle, every open-deck timber bridge presents its own fire hazard. Brake shoe sparks, lighted cigarettes tossed by careless smokers, drippings of molten metal from overheated shoes, oil, coal, and other fuel dropped from locomotive boxes . . . all these elements find a hungry target in unprotected surfaces where ordinary coatings have worn down and cracked to expose splintered wood.

Leading Railroads are now restricting fires with the LIBBEY-ZONE PROCESS* using Heavy-Duty Coating . . . the revolutionary scientific discovery that combines genuine Canadian ASBESTOS FIBRE with intensified elastic ASPHALT GUM to produce a LONG-LASTING, ECONOMICAL, GENUINELY FIRE-RETARDANT SURFACE for open-deck bridges and trestles.

"ZONE" HEAVY-DUTY COATING, when combined with the proper aggregate of crushed stone or gravel, expands with heat . . . yet does not melt; contracts with cold . . . yet does not flake! Laid thickly, the compound's resilient protective coating stretches over cracks and sinks into low spots, yet maintains an even spread and holds aggregate firmly in place when cold. "ZONE" HEAVY-DUTY COATING is easily and quickly applied and has nationwide distribution. Investigate the money-saving advantage of "ZONE" HEAVY-DUTY COATING.

Write for complete information to . . .

**Names of Railroads upon application*

THE ZONE COMPANY

Division of SOUTHWESTERN PETROLEUM COMPANY, INC., Fort Worth, Texas

For additional information, use postcard, pages 609-610

50th birthday of the company whose products you know by the trade-mark: TIMKEN

SINCE 1899 THE TIMKEN ROLLER BEARING COMPANY HAS BEEN HELPING AMERICAN INDUSTRY GET THE MOST FOR ITS MONEY

NOBODY likes to buy a "pig in a poke". In America you don't have to. You're protected by trade-marks like "TIMKEN".

Registered as a trade-mark in the United States Patent Office, "TIMKEN" identifies products made by The Timken Roller Bearing Company: Timken tapered roller bearings, Timken alloy steels and seamless tubing and Timken removable rock bits.

Experience over the years has shown Timken products to be the finest in their respective fields. And many thousands of men and women are working hard to keep them that way. No wonder it has become a habit throughout industry to look for the trade-mark "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

Stop Unnecessary Maintenance Costs

1. Eliminate all Anchor Maintenance. Economic factors today demand devices that require no attention. We recognized this several years ago and worked this feature into our design.
2. How much does it cost to reset or adjust 100 miles of Anchors? With our Anchor this cost is eliminated.
3. Time formerly spent resetting or adjusting Rail Anchors can now be used for other services.
4. We offer the *only* Rail Anchor on the market that does *not* require resetting or adjustment from time to time.
5. This Anchor is demonstrating our claims in track. Let us demonstrate the saving per mile on YOUR track.
6. We solicit the privilege of presenting in person the advantages of this labor saving Anchor without obligation to you and at your convenience.
7. Act NOW and show the saving as a result of YOUR decision.

The price is only 25c

The

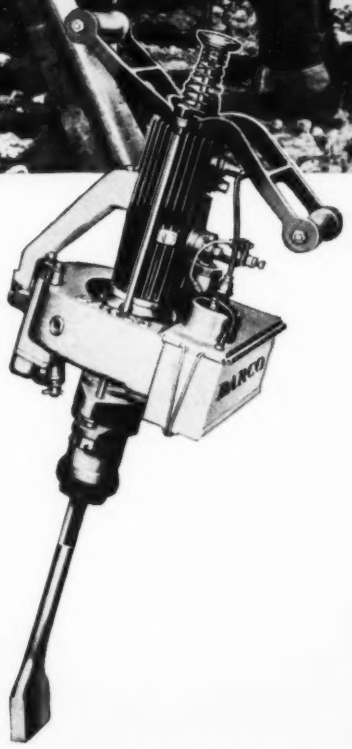
NO-CREEP RAIL ANCHOR

***UNIVERSAL:** This two-way anchor is applicable to any weight of rail or design of tie-plate and is JUST AS EFFECTIVE ON RELAID, WORN RAIL AS ON NEW RAILS.*

G&H RAIL CONTROLS, INC.

Phone BE 8117 **5204 Truman Road** **Kansas City 1, Mo.**

ROADBEDS STAY IN SHAPE LONGER IF YOU USE BARCO UNIT TYTAMPERS



Ballast under a Barco-tamped tie is firmly and uniformly packed for the full width of the tie and is less subject to further compression from passing trains. No other spot tamper produces the fast, powerful blows of the Barco. Self-contained and portable, these economical sluggers save extra time at congested points because they tamp faster and can be moved off the right-of-way quickly. Over 100 railroads use Barco for spot or gang tamping. Write today to Barco Manufacturing Company, 1805 Winnemac Avenue, Chicago 40, Ill. In Canada: The Holden Co., Ltd., Montreal, Canada.

BARCO

UNIT TYTAMPERS

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

MOSS CROSSINGS

. . . WILL SERVE YOU WELL

RAILROADS prefer Moss crossings because they're securely anchored to the cross ties in track and aren't subject to heaving, when the winter freezes and thaws occur.

RAILROADS like them because they rest solidly on those same cross ties and will take all of the pounding the heaviest traffic can give them.

RAILROADS will "write in" our sectional crossings for their inherent economy. Made of pre-framed, creosoted black gum, they can expect many years of trouble-free service.

RAILROADS specify Moss crossings simply because they're the best crossings to be had in any shape, form or fashion.

CROSS TIES
SWITCH TIES
POLES & POSTS
PILING
CROSSINGS

T. J. MOSS TIE COMPANY

The Stamp of Character MTC®

FOUNDED 1879

700 SECURITY BUILDING ST. LOUIS, MISSOURI

WOOD PRESERVING PLANTS

MT. VERNON, ILL.
EAST ST. LOUIS, ILL.
GRANVILLE, WIS.
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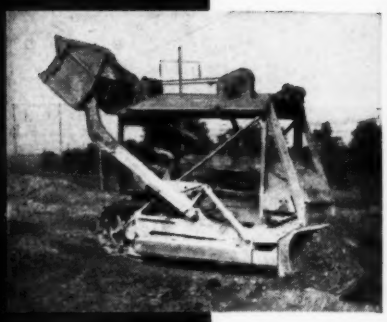
One for all!



One Oliver "Cletrac" crawler tractor with a Sargent Overhead can do all the work of leveling, ditching and grading along the right-of-way.

On this job, for example, one man using the Oliver "Cletrac" and Sargent Overhead leveled a strip 200 feet wide and one-quarter mile long at far lower cost than was possible with other methods.

The strip was leveled and rough graded with the bulldozer. Then, in 5 minutes, the bulldozer blade was removed and the Overhead shovel filled in the low spots along the track to assure good drainage. When the bulldozer is used, the Overhead shovel acts as a counterbalance for most effective dozing.

In addition to the bulldozer and shovel, the Oliver "Cletrac" and Sargent Overhead can be equipped with a backhoe for ditching and trenching work . . . with a coal bucket for loading coal and other loose material . . . and the unit can also be used for snow removal. The Overhead is frequently used for hoisting service around yards and loading points.

For lowest cost maintenance, investigate the Oliver "Cletrac" and Sargent Overhead. See your local Oliver "Cletrac" Distributor.

Cletrac

a product of

The OLIVER Corporation

Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio

OLIVER Cletrac SALES SERVICE

A Complete Line of Crawler and Industrial Wheel Tractors

Announcing–

COPPERIZED CZC-TREATED WOOD for even longer life!

ACCELERATED SERVICE TESTS (Untreated Control = 100)

PRESERVATIVE	SERVICE LIFE TO DATE*	ESTIMATED SERVICE LIFE	ACTUAL SERVICE LIFE
UNTREATED CONTROL	—	—	100
ZINC CHLORIDE	—	—	174
CZC	233	285	—
COPPERIZED CZC	279	519	—

*Based on 85.5 months' exposure. All figures merely express a relationship between treatments and untreated control.

THANKS TO an improved preservative formulation, Copperized Chromated Zinc Chloride, you can count on greater service life from salt-treated wood.

This new formulation . . . the product of cooperative research by chemists of E. I. du Pont de Nemours & Co., Inc., and Koppers Company, Inc. . . . provides longer service life than Chromated Zinc Chloride, the salt preservative from which it was developed. Accelerated service tests bear this out, as shown in the accompanying table.

While adding extra years of service, this new preservative retains all the outstanding advantages of CZC. It is decay resistant, termite repellent, clean, odorless and paintable. There is no loss of strength in wood treated with Copperized CZC.

You'll add years of service to car lumber, platforms, roof decking and other installations, by using wood pressure-treated with this new COPPERIZED CZC. It's a worthwhile investment . . . investigate it today.

KOPPERS COMPANY, INC.
Pittsburgh 19, Pa.

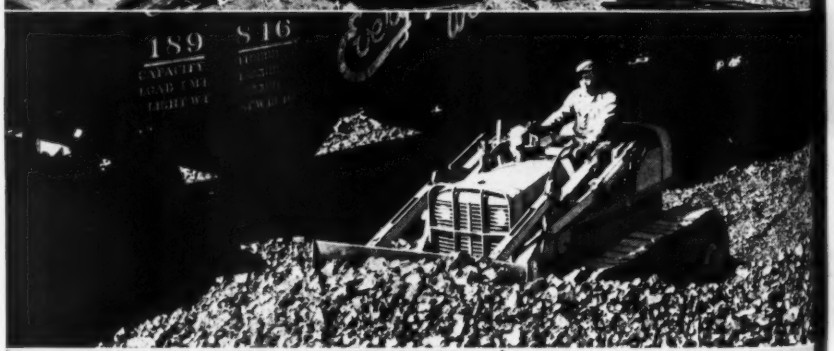
KOPPERS **PRESSURE-TREATED WOOD**

FAST WORKING

Allis-Chalmers Tractors quickly return tracks to service after wrecks, washouts, other traffic interruptions . . . are easily moved by flat car, trailer or under own power, go into action immediately . . . work at many points all along tie-up . . . build shooflies in record time.

VERSATILE

Allis-Chalmers Diesel Tractors are used with bulldozers, scrapers or front end shovels on stockpiling—also with rollers, rippers, graders, snow plows, winches, tractor cranes on any number of jobs. Go anywhere . . . handle grading jobs impossible to reach with work trains.



FLEXIBLE

You can put exactly the number of tractors on a job that are required—one or two on a regular job or a fleet on a big, rush project. There is a right size Allis-Chalmers tractor for any grading or maintenance job.

NO INTERFERENCE

Operating free of the tracks, this Allis-Chalmers HD-7 Tractor with Gar Wood bulldozer and 5-yd. scraper keeps working while your trains go through on schedule — no interruption of traffic or maintenance work. Many railroads find that tractors put in as much as 50 percent more production time than rail-bound equipment.

One man WORK CREW

☆ ☆ ☆

ONE man grades slopes, backfills, easily handles ditching, diking — many other right-of-way jobs with an Allis-Chalmers 2-cycle Diesel Tractor equipped with bulldozer and 2-wheel, rear-dump scraper.

This fast-stepping outfit takes over much of the work of big track-bound equipment, does not interfere with rail traffic, relieves hand labor. It digs and loads toughest materials, carries and places them exactly where wanted — on slopes, around bridges, culverts, other close places. Ideal for stockpile maintenance.

It will pay you to investigate this one-man outfit for reducing construction and maintenance costs. We will be glad to put you in touch with your Allis-Chalmers dealer for complete details.

2-cycle Diesel Tractors
4 Models
11,000 to 40,000 lb.

•

Motor Graders
Power Units
Road Machinery

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE 1 U. S. A.

DU PONT ANNOUNCES

A New and Improved Wood Preservative

COPPERIZED CZC

(Chromated Zinc Chloride)

Gives even longer-lasting all-round protection

Now—timber and lumber can have even greater service life than has been obtainable with standard CZC (Chromated Zinc Chloride) treatment. New Du Pont *Copperized* CZC—backed by ten years of laboratory research and field testing—gives promise of being the best all-round salt-type wood preservative ever developed.

In addition to showing far greater preservative effect than standard CZC (Chromated Zinc Chloride), this outstanding new *Copperized* product offers all these same advantages:

- Decay resistance
- Termite repellence
- Fire retardance
- Cleanliness
- No odor
- Safe to handle
- Easy to paint

THESE 6 SIGNIFICANT TESTS SHOW ITS EFFECTIVENESS

1. Leach block test
2. Hardware corrosion test
3. Accelerated service test
4. Pilot plant treatments
5. Strength tests
6. Glow tests

Clip coupon for more facts *on new Copperized CZC. E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Dept., Wilmington 98, Delaware.*

DU PONT
REG. U.S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING THROUGH CHEMISTRY

COPPERIZED CZC
(Chromated Zinc Chloride)

E. I. du Pont de Nemours & Co. (Inc.)
Grasselli Chemicals Department—RE-1
Wilmington 98, Delaware

Please send me more facts on new Copperized CZC.

Name_____ Title_____

Firm_____

Street_____ State_____

For additional information, use postcard, pages 609-610

that inspector really gets around!

—and he gets around in comfort and safety in his cab-shielded Fairbanks-Morse motor car. Here's an easy-to-handle car that's ideal for inspection service, for track patrolmen, linemen and supervisors. There's ample room for two men and their equipment, and the compactness and simplicity are preferred by old hands on rails the country over. Fairbanks, Morse & Co., Chicago 5, Ill.

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MOTORS • GENERATORS • STOKERS • RAILROAD MOTOR
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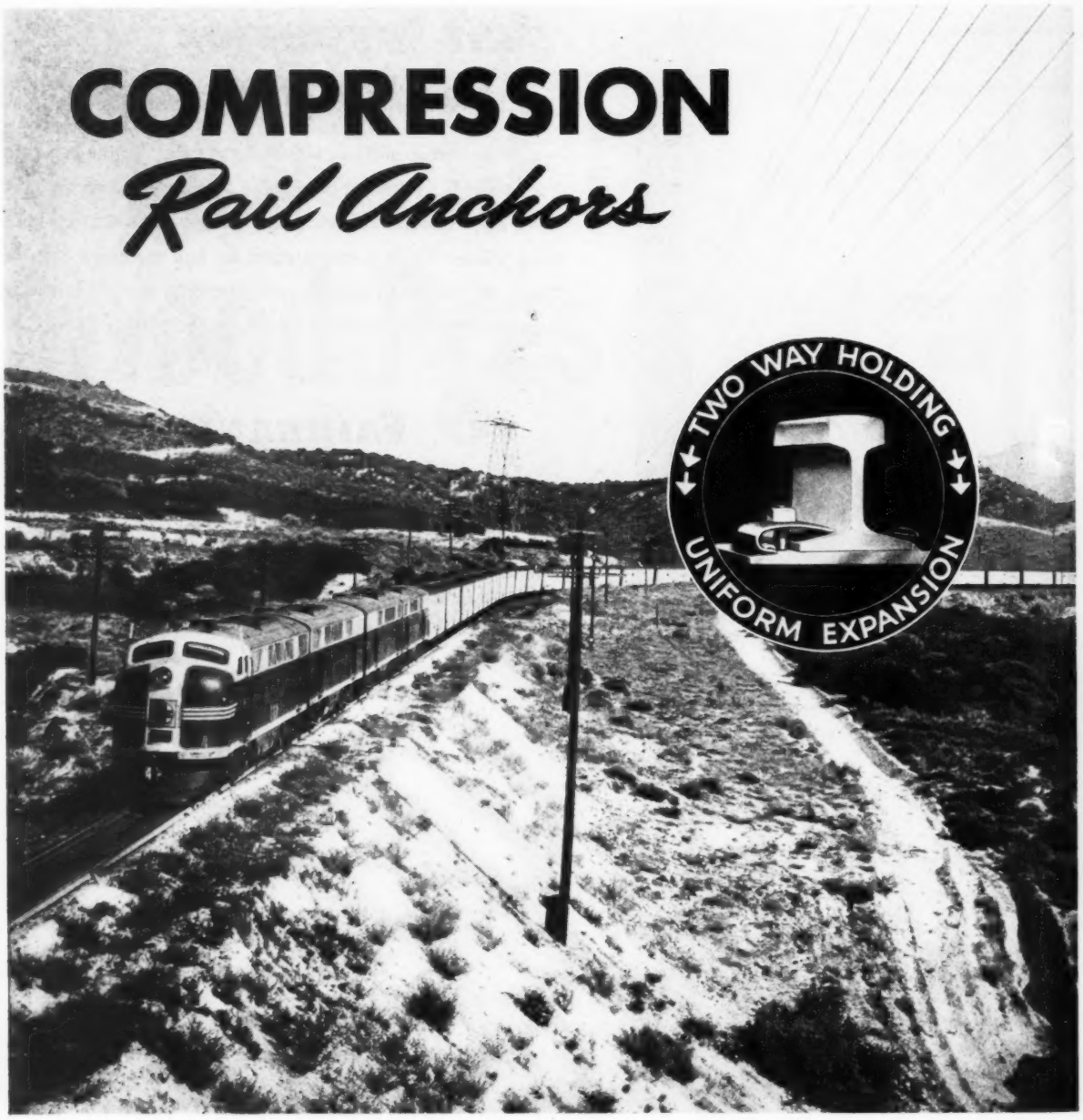
COMPRESSION
Rail Anchors



Compression-held rail is doubly-held against creepage. It is anchored against movement in both directions. Compression Anchors are delivering this economical, two-way protection on a host of railroads.

THE RAILS COMPANY

General Office
178 GOFFE STREET, NEW HAVEN 11, CONN.

ST. LOUIS, MO. HOBOKEN, N. J. CHICAGO, ILL.

Pittsburgh STATIONHIDE

GIVES STATIONS NEW BEAUTY THAT LASTS LONGER!

MATCH the modern beauty of trim, sleek streamliners by bringing your stations up-to-date with Pittsburgh STATIONHIDE.

By using color arrangements that emphasize the best architectural features and subdue awkward angles and lines, these stations can be made to appear lower, neater and more attractive. Use of appropriate color combinations can also make interiors brighter, cheerier and more comfortable.

Pittsburgh offers STATIONHIDE in a variety of modern colors for inside and outside use. STATIONHIDE for exteriors is a scientifically prepared finish, custom-made for the job of beautifying and protecting railway stations. It brushes or sprays easily, dries to a tough, elastic coating which will not discolor or darken from coal smoke or industrial fumes and will stand up under severe climatic conditions.

Interior STATIONHIDE for walls and trim is an economical, durable finish in a variety of colors which will withstand the hardest kind of wear.

Call on us for expert advice. Our wide experience in the field of railway finishes often can save you time and money.

• • •

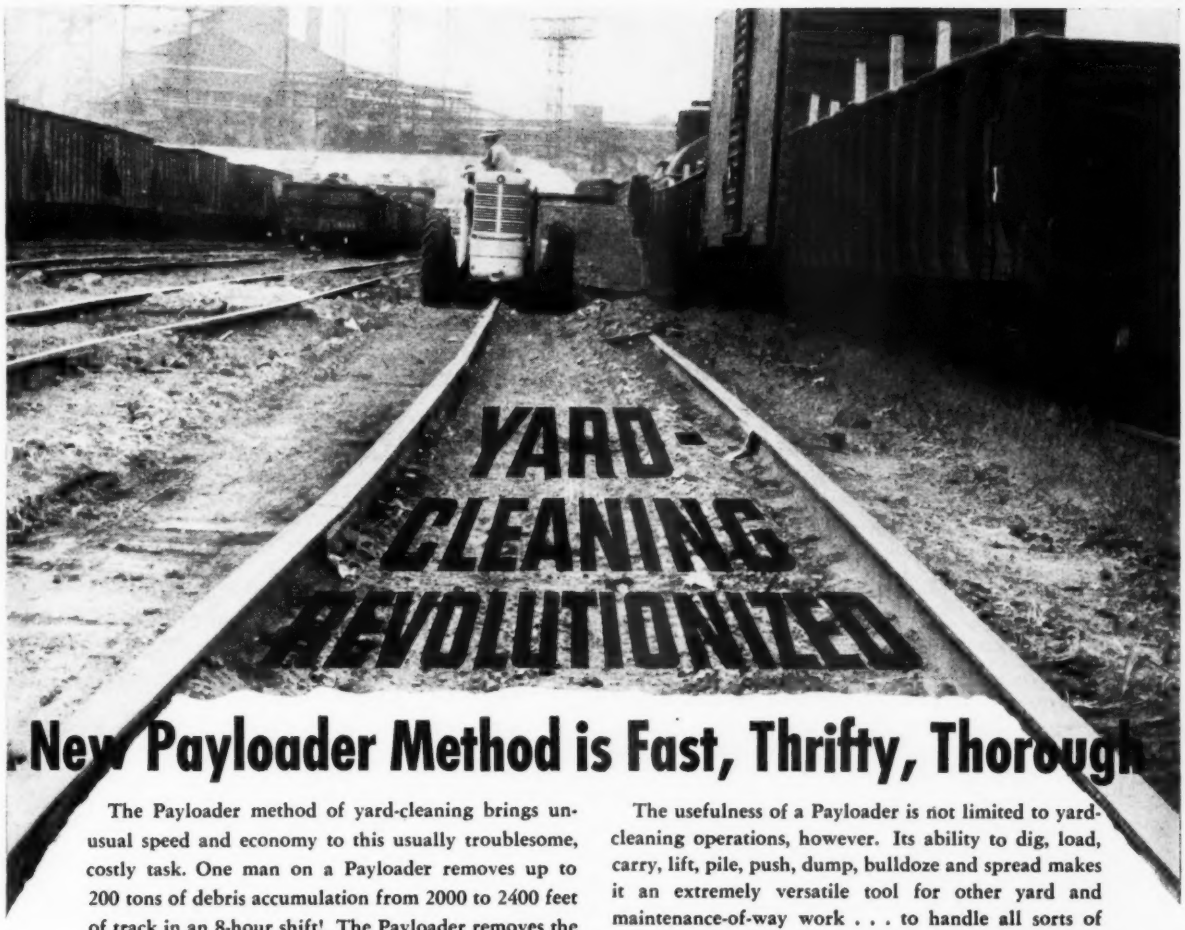
PITTSBURGH PLATE GLASS COMPANY
Industrial Paint Division, Pittsburgh, Pa.
Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Division, Detroit, Mich. The Thresher Paint & Varnish Co., Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio.

Write for this FREE Booklet!
Contains Pittsburgh's complete line of Railway Structural Maintenance Finishes with many practical suggestions for their efficient and economical use.

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY



New Payloader Method is Fast, Thrifty, Thorough

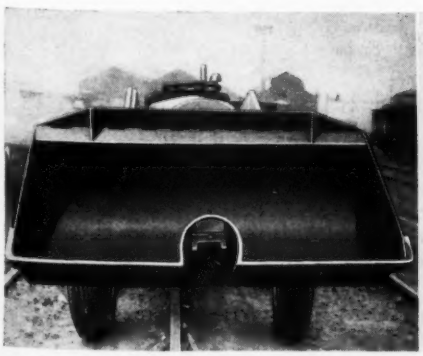
The Payloader method of yard-cleaning brings unusual speed and economy to this usually troublesome, costly task. One man on a Payloader removes up to 200 tons of debris accumulation from 2000 to 2400 feet of track in an 8-hour shift! The Payloader removes the refuse between the rails and tracks, carries its loads and dumps directly into railroad gondolas or trucks.

Key of the operation is the special bucket which has a central tunnel design that straddles the rail and digs on either side to a controlled depth. The large pneumatic tires of the Payloader walk over rails readily and provide tremendous traction for fast, efficient work.

The usefulness of a Payloader is not limited to yard-cleaning operations, however. Its ability to dig, load, carry, lift, pile, push, dump, bulldoze and spread makes it an extremely versatile tool for other yard and maintenance-of-way work . . . to handle all sorts of loose materials, to excavate, grade, load coal, clean up, remove snow, etc.

The special yard-cleaning bucket can be interchanged in a few minutes with the standard bucket, Bulldozer Blade or Crane Hook attachments. Full facts on Payloaders for yard-cleaning and other uses are yours for the asking. The Frank G. Hough Co., 751 Sunnyside Avenue, Libertyville, Illinois.

HOUGH
PAYLOADER
Manufactured by THE FRANK G. HOUGH CO.



The Special Bucket is 6 feet wide and straddles the rail. A Guide Shoe insert in the tunnel rides the rail . . . keeps bucket centered and limits depth of cut . . . is adjustable for various sizes of rail.

Right down the rail goes the Payloader without delay cutting to full depth allowed by the guide shoe. As soon as the bucket is full, it carries and dumps the load directly into gondola or truck.

Above: UTILITY GRINDER, Model UG, removing flow at switchpoints and stockrails. With other Nordberg accessories, it can be used for surface grinding, rail end slotting, frog grinding, etc. Particularly suited to work in congested traffic areas.

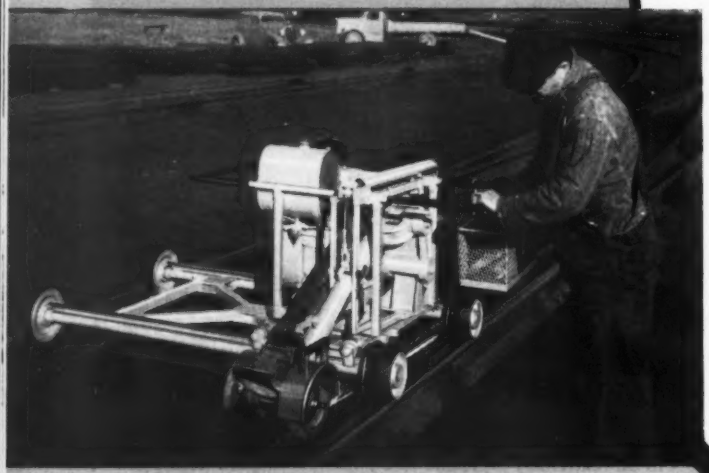
NORDBERG GRINDERS

for every rail, switch or frog grinding job

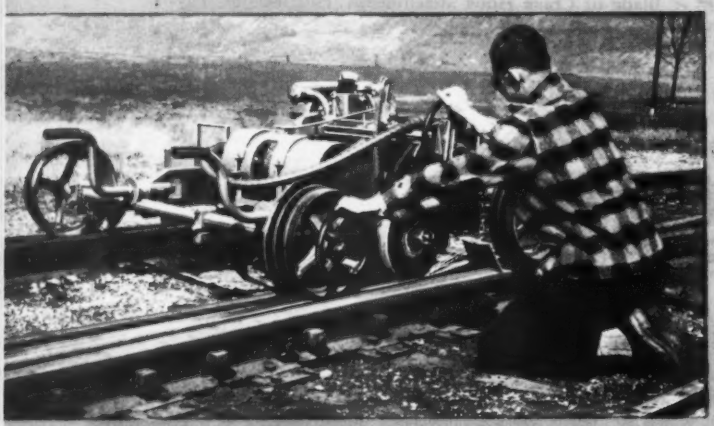
From these Nordberg Grinders, select the grinder best adapted to your track maintenance grinding requirements. You can be assured of faster and better maintenance grinding with Nordberg on the job.

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN

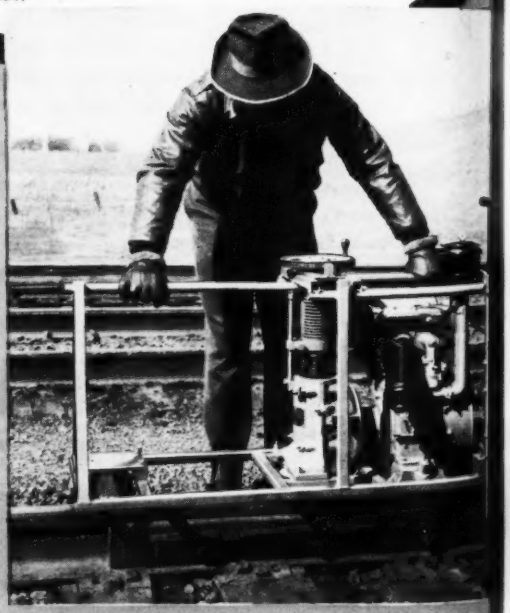
R649



Above: FLEXIBLE ARM GRINDER, Model FG, grinding switchpoint. With various types of grinding wheels this grinder is also used for rail end slotting, undercutting stockrails, grinding frogs, etc. A fast cutting grinder with big production capacity.



Above: HEAVY-DUTY RAIL GRINDER, Model BDG, grinding a frog. Recommended where speed, output, and accurate surface grinding are desired. With accessories, it can be used for slotting rail ends, grinding switchpoints, and flangeway grinding at frogs and crossings.



Above: MIDGET GRINDER, Model EG, a one-man ... wheel grinder for surface grinding welded joints, ... moving mill tolerance, equalizing cropped rails, ... grinding out corrugations or wheel burns. It is especi... ly applicable for use in congested traffic areas.

NORDBERG TRACK MAINTENANCE MACHINERY

Saves time — Does better work — Reduces expense

RID YOUR TRACKS OF WEEDS · · ·

PERMANENTLY

with GENERAL CHEMICAL Formula 7B Weed Killer

WHY BE CONTENT WITH temporary, *seasonal* relief from railroad weeds and grass? Now your goal can be complete elimination of this nuisance . . . by regular use of General Chemical Formula 7B Weed Killer.

FORMULA 7B is the ideal formulation for controlling weeds and grass—its special Trichloroacetic Acid and Oil combination is the secret of its powerful effectiveness.

IT IS this unique formula *made for railway weed control alone* that assures you of ultimate sterilization of weeds and grass . . . not merely short-term relief.

COMPLETE CONTROL FOR ALL CONDITIONS

By actual test—this highly potent weed killer gets results where many ordinary weed killers fail. See for yourself what it can do for your tracks. A "custom-planned" application service of Formula 7B is available to combat all conditions of railroad weeds and grass.

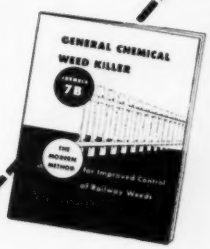
KILLS Grasses

KILLS Broad-leaved Weeds

SUPPRESSES Seed Germination

RESISTS Washing Away by Rainfall

Helps **PRESERVE** Track Structure



SEND FOR FREE FOLDER ON FORMULA 7B

For detailed information on what this powerful weed killer can do for your tracks—get this free folder on Formula 7B. Mail coupon today!

GENERAL CHEMICAL WEED CONTROL

Weed Killer Department
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Weed Killer Department
General Chemical Division
Allied Chemical & Dye Corporation
40 Rector Street, New York 6, N. Y.

I want to know more about what General Chemical Formula 7B can do. Please send your free folder.

Name _____

Title _____

Railroad Address _____

City _____ *Zone* _____ *State* _____ REM-6

CONCRETE PILES

...built to last under severe salt water exposure

COVERING an over-water area of ten acres, the new Norfolk and Western Railway merchandise pier at Lambert Point, Norfolk, Va., is supported by 5,406 concrete piles averaging 70 ft. in length. These piles had to be designed to withstand severe exposure and salt water action. This was accomplished by using a relatively rich mix (1:2½:3½ with 5½ gal. of water per sack of cement).

Designing durable concrete piles is another application of the well-defined and thoroughly-tested principles and procedures of quality concrete construction. These principles and procedures are the key to strong, enduring concrete that performs satisfactorily under any climatic, soil, water or service condition.

For complete details about quality concrete write for a 70-page book, "*Design and Control of Concrete Mixtures.*" If you'd like more information about concrete piles, send for 80-page illustrated book, "*Concrete Piles.*" Both are free but they are distributed only in the United States and Canada.

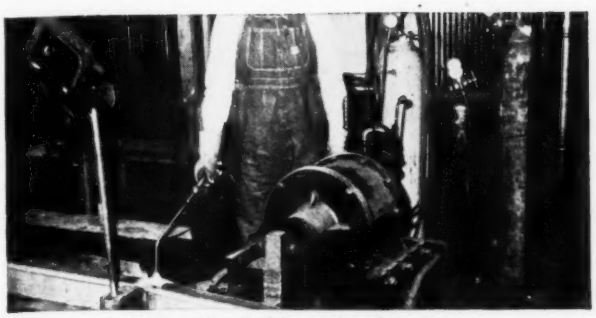
PORTLAND CEMENT ASSOCIATION

DEPT. A6-27, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

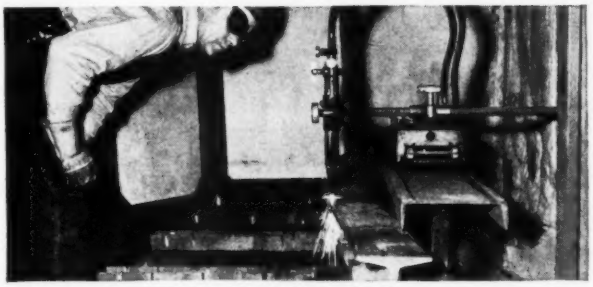
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

WHAT'S THE BEST WAY

. . . to fabricate rigid frogs?

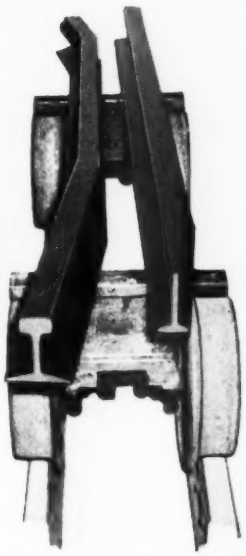


Heating Wing Rail for Bending Operation



Cutting Wing Rail After Bending

Cutting Long Point Rail



Both Rails After Bending, Cutting and Finishing

Use the Oxyacetylene flame processes!

Airco Railroad Service Representatives recently supervised the fabrication of rigid frogs in a large railroad shop. They observed costs and results. On the basis of this experience, they recommend:

For Bending – heat both the wing rail and the long point rail in required places with the oxyacetylene flame. This simplifies the actual bending operation – cuts time and cost.

For Cutting – make the two cuts on ball and the two on the base of long point rail with the Airco No. 10 Radiagraph (portable, oxyacetylene gas cutting machine) and using the same machine make the necessary cut on the wing rail.

This type of cutting operation was found to be far more economical and less time consuming than doing the same job by other means.

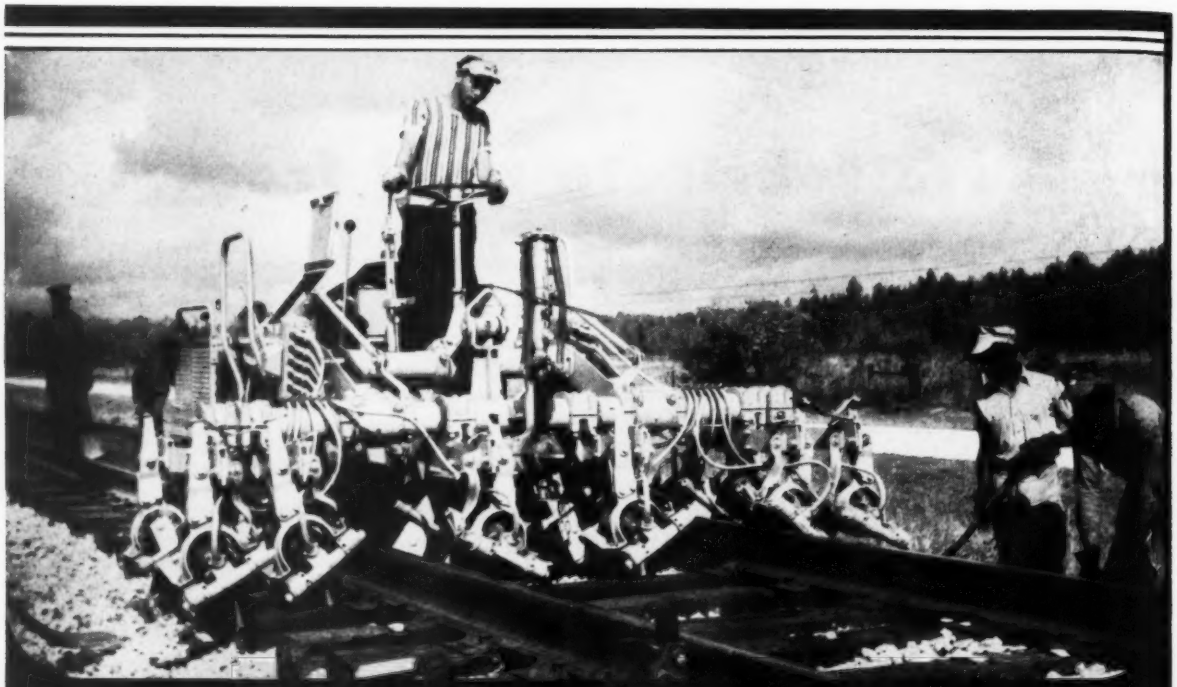
For more information about the above job and other oxyacetylene flame or arc welding applications, write your nearest Airco office. (In Texas: Magnolia Airco Gas Products Company. On West Coast: Air Reduction Pacific Company.)

Costs Come Down Under The Airco Plan

AIRCO **AIR REDUCTION**

Offices in Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Cutting Machines . . . Gas Welding Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories



THE JACKSON "M-T"

... ——— a sound solution to the 40-HOUR-WEEK PROBLEM: ———

If higher pay rates and the 40 hour week appear to make adequate ballasting operations impossible within the limits of your budget, do one of two things:

1. Call in a Jackson consulting engineer — a practical individual thoroughly trained in maintenance methods and practice and one who talks your language. He can answer all your questions in short order and explain how the Jackson "M-T", operating under the conditions obtaining on your particular road, can help you to a sound solution of your problem. Or . . .

2. If you would rather simply study a Jackson "M-T" in actual operation, write for nearest location.

Prompt deliveries can be made to those who wish to capitalize on the tremendous advantages of this machine during the rest of the season. Write, wire or phone us, Now!

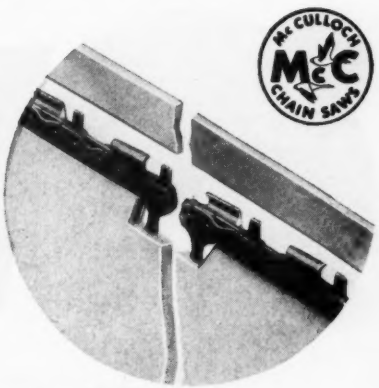
ELECTRIC TAMPER & EQUIPMENT CO. Ludington, Michigan

Here's Why McCULLOCH Saws *start fast... and cut fast*

Conventional magneto, with coil inside flywheel, gives less spark at low speeds.

McCulloch magneto gives hotter spark at low speed. Magnetic lines of force are broken faster, because of higher rim speed at a given cranking rpm.

THESE FEATURES *SAVE TIME* IN RAILROAD TIMBER WORK

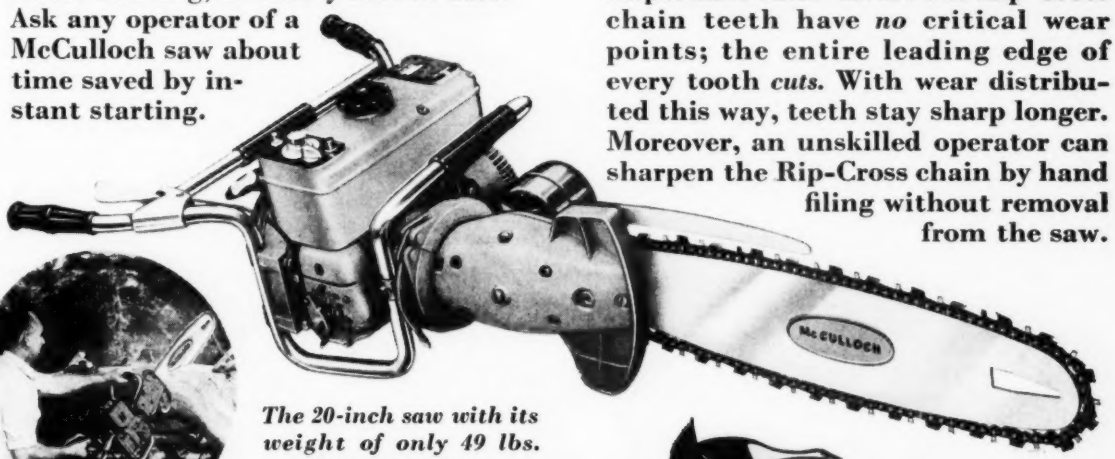


they start fast

The sketch shows how the McCulloch magneto differs from the conventional type. At any given cranking speed, magnetic lines of force are broken faster, giving a hotter spark at low speeds. The hotter spark means faster starting, in theory and in fact. Ask any operator of a McCulloch saw about time saved by instant starting.

they cut fast

The special curved teeth of the McCulloch Rip-Cross chain, driven by 5 honest hp, actually scoop out the wood—with or against the grain or at any angle, in any kind of hard or soft wood. And here's another important time-saver: the Rip-Cross chain teeth have *no* critical wear points; the entire leading edge of every tooth *cuts*. With wear distributed this way, teeth stay sharp longer. Moreover, an unskilled operator can sharpen the Rip-Cross chain by hand filing without removal from the saw.



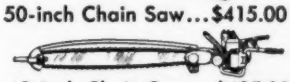
The 20-inch saw with its weight of only 49 lbs. and full-swivel blade, can be easily operated in any position by one man.

6 MODELS AVAILABLE—ALL INTERCHANGEABLE

20-inch Chain Saw...$385.00

50-inch Chain Saw...$415.00

30-inch Chain Saw...$395.00



60-inch Chain Saw...$425.00

40-inch Chain Saw...$405.00

20-inch Bow Saw $425.00

All prices f. o. b. Los Angeles

McCULLOCH MOTORS Corporation

6101 W. Century Blvd., Los Angeles 45, Calif. Dept. MR

SEND FOR FULL INFORMATION

McCULLOCH MOTORS CORPORATION
6101 W. Century Blvd., Los Angeles 45, Calif., Dept. MR

Please send complete information on the 5-hp McCulloch chain saw and name of nearest dealer.

Name_____

Firm name_____ Type of work_____

Address_____ City_____ State_____

For additional information, use postcard, pages 609-610

Talk about strength—ARMCO Liner Plates really have it. The tough, sinewy kind that is not burdened with excess weight.

One glance at an ARMCO Liner Section will show you why. See those deep corrugations and flanges. They are designed to provide safe strength without excess weight or bulk. This is why ARMCO Liner Plates cost less to carry a given load than any other type.

High strength-to-weight ratio also means that ARMCO Liner Plates are easy to handle and install. One man can carry, hold and bolt a section into place with simple hand wrenches. Less bulk also means less excavation. Jobs go fast—labor costs are low.

You can have complete confidence in ARMCO Tunnel Liner Plates for new openings or for relining existing structures. They are ideal for conduits, tunnels, underpasses and wherever else you need the protection and other advantages of a steel liner. There is no interference with traffic during installation. Inside diameters range from 45 1/4 inches to 33 feet. Write for complete information now, and be ready for that next job. Armco Drainage & Metal Products, Inc., 325 Curtis Street, Middletown, Ohio. Export: The Armco International Corp.

ARMCO TUNNEL LINER PLATES

ARMCO

"The men like to work with penta-chlorophenol treated poles! —THEY'RE CLEAN!"

Workmen, who maintain communication and power lines, enjoy working with poles that have been given the PENTA-chlorophenol treatment. This modern wood preservative leaves poles clean and easy to handle.

Railroad men everywhere appreciate that PENTAchlorophenol-treated poles *last longer*, for they have been given thorough, lasting protection against decay and termites.

Specify the PENTAchlorophenol treatment for safeguarding *your* poles, crossarms, ties and other wood construction.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

DOW
penta-
chlorophenol

Light-Simple-Effective

RACINE UNIT TIE TAMPER

Saves Labor, Time and Tempers

WHY USERS LIKE RACINE TAMPERS

★ **Light in weight — Less than 60 lbs.**

★ **Patented, special alloy spring assembly throws the hammer and cushions the recoil. No shock on operator. No manual pressure needed to compact ballast.**

★ **1500 high velocity blows per minute, combine with stirring action for fast, effective work in all types of ballast.**

★ **Tamping bars last longer — because they are protected by inherently balanced blow and recoil, and a rubber cushioned tool holder head.**

★ **Maintenance cost is low — extremely simple assembly of few working parts, reduces replacements and repairs below all previous standards.**

Three years of field service prove the RACINE Unit Tamper superior. It is lighter in weight, easier to carry, trouble-free and long-lived.

The unique, patented, special alloy spring assembly, creates a sling-shot like action. All the operating shock is contained within the machine, the operator remains steadily at work without fatigue.

Easy starting in heat or cold. Ready for work within seconds after pulling built-in starter cable. Magneto ignition — no batteries to fail or be lost. Lubricated by oil in gasoline. Fumes exhausted from engine — none through operating mechanism and sliding ways to cause carbon and wear.

Fully guaranteed — performance qualities have been demonstrated by three years of laboratory and field tests as well as continuous use under varying working conditions across the country. Complete information supplied to maintenance men without cost, obligation or high-pressure sales follow-up.

WRITE TODAY FOR INTERESTING CATALOG

STANDARD FOR QUALITY AND PRECISION · RACINE · RACINE TOOL and MACHINE CO.

RACINE TOOL AND MACHINE COMPANY

1738 State St., Racine, Wis.

★STANDARD FOR QUALITY AND PRECISION

For additional information, use postcard, pages 609-610

High production — low expense — hard work made easy and fast; these are features designed and built into every Link-Belt Speeder Shovel-Crane. Features that owners brag about, features that show up favorably on the annual profit and loss statement. Back of every Link-Belt Speeder is a well-equipped distributor with factory-trained service men and a full stock of parts to keep every Link-Belt Speeder in tip-top operating condition. Call your Link-Belt Speeder distributor now.

•

Crawler-mounted, off-the-track equipment is the logical choice for railway construction and maintenance. It is easy to maneuver into the best working position and operates without regard to rail traffic. Link-Belt Speeder's quick convertibility gives high utility value to this rugged machine. It's a shovel, crane, pile driver or trench hoe as needed. And there's a size to suit every situation.

•

Shops and stores find the YC-9 Link-Belt Speeder CARGOCRANE (the mobile lift-and-carry machine) indispensable in repair, loading and handling operations. Full hydraulic control. Details in Bulletin No. 2262.

SPEED-O-MATIC CONTROL

"Speed-O-Matic" hydraulic control permanently eliminates all "lost motion" — actuates clutches faster and more smoothly. Operators will tell you the "Speed-O-Matic" control relieves manual effort and there is little or no fatigue after a good day's work. Get the facts today—find out how you, too, can greatly increase your output.

11,498-A

LINK-BELT SPEEDER

LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS IOWA

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

paint

-GOES ON FASTER
-BONDS TIGHTER
-LASTS LONGER

WHEN SURFACES ARE CLEANED **FIRST** BY

OXY-ACETYLENE FLAMES

THREE STEPS FOR BEST RESULTS:

1. Flame-Cleaning — loosens scale, drives out moisture.
2. Wire-Brushing — removes loose material.
3. Painting — spreads easily on the warm, dry surface.

Ask an Oxweld representative for complete information.

THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation

UCC

Carbide and Carbon Building Chicago and New York

In Canada:
Canadian Railroad Service Company, Limited, Toronto

OXWELD
RAILROAD SERVICE

SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

FABREEKA *Pads*

Bridge at Point Pleasant, West Va.
on the Baltimore & Ohio Railroad System
American Bridge Company Construction

In This Bridge

ON THE BALTIMORE & OHIO RAILROAD SYSTEM

Used to

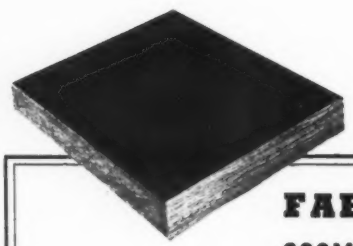
REDUCE IMPACT SHOCK

ABSORB VIBRATION

REDUCE MAINTENANCE

EXTEND BRIDGE LIFE

Steel ties are used as fire stops. Fabreeka, ¼" thick is used between the steel ties and the supporting stringers in order to intercept metal to metal contact. By reducing the destructive effects of heavy impact shock and vibration, the bridge life is extended and maintenance costs are reduced. Fabreeka is the ideal material for this service because it withstands the heavy loads without permanent set or deterioration and insures the bolts remaining tight.



It Pays to Specify Fabreeka

FABREEKA PRODUCTS COMPANY INC.

222M SUMMER STREET BOSTON 10, MASS.

NEW YORK PHILADELPHIA DETROIT CHICAGO

SPARTANBURG, S. C. OAKLAND, CALIF.

VIBRATORY ACTION

A Prime Requisite for MAXIMUM consolidation of Ballast

IS SUPPLIED

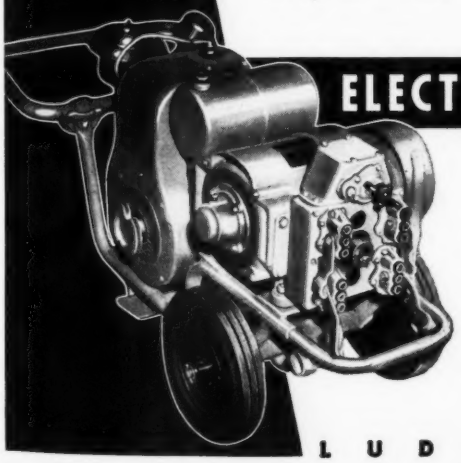
EXCLUSIVELY

BY

JACKSON TIE *Tampers*

The unique, powerful, vibratory action of Jackson tampers with their sidewise, forward and fluttering action, keeps the surrounding ballast in constant motion, feeds it to the end of the blade and shuffles the ballast around until the pieces are tightly fitted together into a closely integrated, soundly compacted and lastingly firm bed — nearly as smooth as a mosaic floor. There can be no particles of ballast wedged on end beneath the tie — no open spaces. Only VIBRATORY action can give you that kind of a job, and JACKSON, alone, supplies it. Complete details supplied on request. Drop us a line.

ELECTRIC TAMPER & EQUIPMENT CO.



Four Jackson Vibratory Tampers with the M-2 power plant constitute an extremely flexible outfit. It's ideal for section gangs and also unexcelled when grouped for extra gang operations.

M-2 POWER PLANT

L U D I N G T O N · M I C H I G A N

No. 246 of a Series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION 79 W. MONROE STREET CHICAGO 3, ILL.

Subject: An Ideal Sales Medium

June 1, 1949

Dear Mr. Railway Supply Man:

Every once in awhile one of you—especially if new or relatively new in the railway field—wants to know if Railway Engineering and Maintenance is really read and valued by railway engineering and maintenance officers. To determine exactly who receives our publication regularly, you can readily check up through the Audit Bureau of Circulations, of which we are a member. But you want to know if Maintenance is looked forward to, is read regularly and thoroughly, and is thus rendering a real service in the field. In effect, is our publication the ideal medium in which to place sales messages relative to your services or products?

We would welcome your addressing such questions to any of our readers because we have many reasons to know that Maintenance is read, is valued, and is rendering a real service. Six of these reasons—six of many—are embodied in the following comments gleaned from my mail within the last few weeks, which may answer your questions, in part, at least.

"I know of no other means of reaching higher maintenance officers and supervisors with the information contained in your publication, which is so highly beneficial in keeping before them the best in the way of methods to overcome problems that arise."—Chief maintenance officer.

"As a regular reader of Railway Engineering and Maintenance, I want to compliment you on your latest issue. I have been a reader of this magazine for more than 20 years and have gotten a great deal of valuable information from it."—Division engineer.

"You and your staff are performing work of inestimable value to railroad men, and it is my hope that you can continue this until every railroad man throughout the country is well aware of it."—System officer in charge of work equipment.

"Your publication is doing a fine work for people who, like myself, are engaged in the roadway maintenance end of the railroad business."—System maintenance officer.

"You are doing so much for the railways and the supply firms that they could never do for themselves. The constant appeal of Maintenance is a tribute to your ceaseless search for all that is good for the railway world."—Supervisor of track.

"Your publication fills a need in the maintenance-of-way field that is outstanding. May your organization long continue to give us this needed information in such an attractive and authoritative form."—Chief maintenance officer.

We're proud of such comments about our publication—strive constantly to continue to merit such—and think that just so long as we do, you men in the railway supply field can be pretty sure that our pages make the ideal place for you to tell your sales story to railway engineering and maintenance officers.

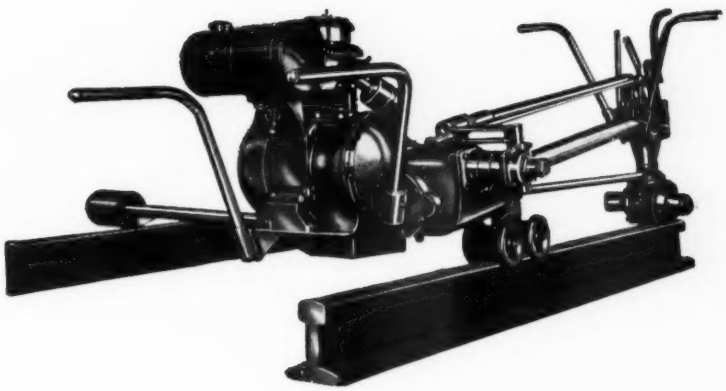
Sincerely,

Neal D. Howard

NDH:ag

Editor

4000-6000 Man-Hours SAVED per Machine per Year



A CIRCULAR showing how these savings are accomplished in various rail operations will be mailed in the near future.

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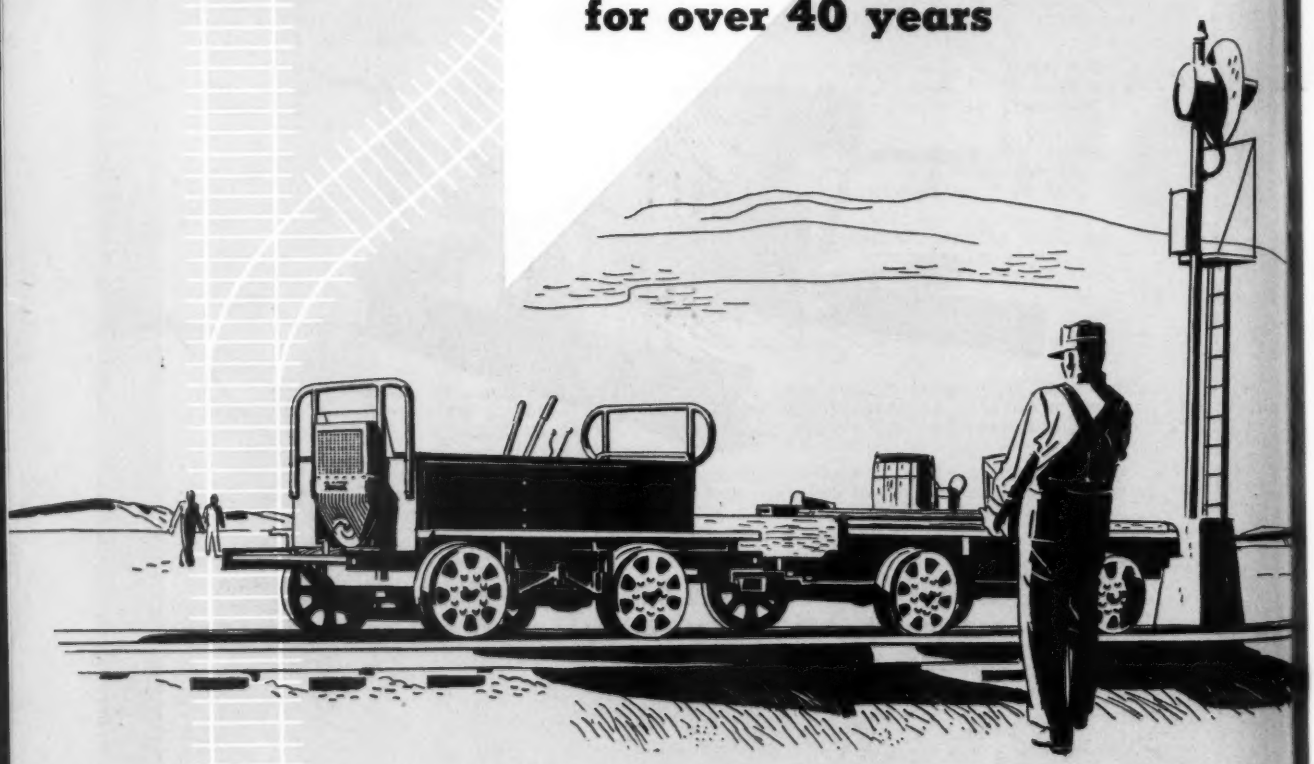

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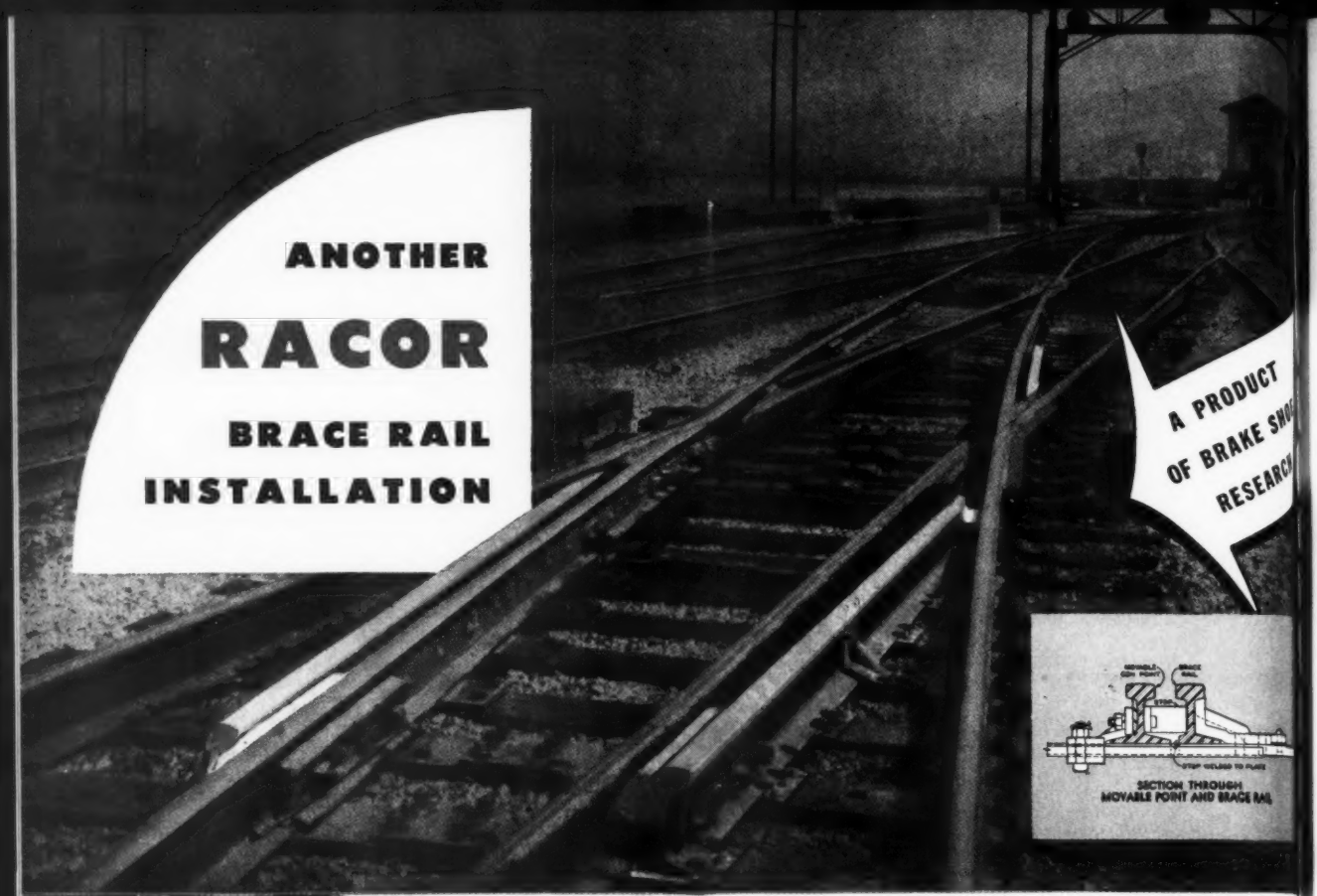

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Improvement Capital—

Roads Must Have Large Sums Annually to Keep Abreast

The railroads of America have become the great service institutions they are because, through research and invention, and the investment of vast sums of money, they have constantly been able to increase their efficiency, lower their costs, and better their service and dependability.

From close to close of the two World Wars, the railways spent nearly $13,750,000.000 on better plant and facilities to improve their service and lower costs. Since the end of the last war they have already spent more than $2,500,000,000 for similar purposes. Now they are planning additional large expenditures, maybe record expenditures, in the current year, for further additions to and betterments of their properties—if they can raise the money—convinced that only by making huge expenditures yearly in the interest of better service and lower costs, can they hope to keep up with the parade—the advances being made by competitive forms of transportation and the demands of the traveling and shipping public.

According to estimates submitted to the Interstate Commerce Commission's Bureau of Statistics and Economics, 127 Class I roads of the country, representing all but four such roads which did not report, expect to make gross capital expenditures of $1,342,000,000 in 1949, which is an increase of 9.4 per cent above the $1,226.701,000 spent by these roads in 1948, when all of the Class I roads spent a total of $1,265,869,-546. But continued expenditures for capital improvements in 1949, in themselves, will not be enough—more must be spent in 1950, in 1951, in 1955, and beyond, if the well-being of the railroads, and the country, is to be assured.

Early this year the President's Council of Economic Advisors estimated that railway expenditures for capital improvements should, for a period of years, average from $1.3 billion to $1.4 billion (at 1947 prices) annually—or about one-sixth more than in 1948, which was the highest year for capital outlay in the railroads' history. Other analysts have estimated that the roads must spend as much as $1,740 000,-000 annually for the next ten years, to keep pace with competition and requirements.

Railroad men who are aware of railroad needs fully agree with these estimates for large capital additions and betterments, and some would increase them. The only question is where all the money to finance such a sustained improvement program is going to come from, especially for improvements to the fixed properties—and that is causing worry aplenty.

Back in the years following World War I (1921-1931), the railroads were able to go to the public and borrow money by selling fixed-interest bonds or raise funds by selling equity stocks. But with the onset of the depression the picture changed completely and, as was pointed out by one railroad financial analyst recently, with one exception, there has not been a single bond or stock issue sold by any American railroad since March, 1931. During this 17-year period, with the exception of "refundings" and "equipments," he said, the American railroads were not able to take a dime from American investors in the form of stocks and bonds.

This inability of the railroads to raise the money needed to finance essential capital improvements lies in past and continuing lack of confidence in them on the part of the investing public, and any assurance that investors will be allowed to share in the benefits made possible through the use of their funds. To restore confidence will require many

things, including adequate rates, relief from burdonsome taxation and regulation, the cessation of huge subsidies to competitive forms of transportation, a more understanding attitude on the part of employees as a whole, and establishment in the minds of the public, beyond doubt, that the railroads are, themselves, doing their very best to make the most of what they have.

Unless this public confidence can be restored, the future of the American railways as private free enterprise is in jeopardy, because, as pointed out recently by R. L. Williams, president of the Chicago & North Western, the rate of progress toward greater efficiency and economy in railroad operation is influenced, and in many instances is absolutely controlled, by the availability of capital money. More to be feared is the possibility that, if the railroads cannot finance adequate improvements to keep abreast of needs, the Federal government will step in to do what private capital is unwilling to do.

This is not a healthy picture to contemplate, but it will remain the picture until railway managements, railway employees, government bodies, investment circles and the public get together and take the necessary steps to change it.

MOVING FACILITIES—

Ingenuity Needed to Develop Best Methods

RAILROADS are constantly finding it necessary, for one reason or another, to move buildings or other facilities from one point to another, sometimes only a few feet away, but often much farther. In such instances the application of a little ingenuity in tackling the problem will frequently result in substantial savings in the cost of doing the work. Whereas the moving of a structure without dismantling it may appear at first glance to be impractical, ingenious minds can usually find a method of accomplishing the task in this manner. Further, those experienced in this type of work will carefully explore various methods of doing a particular job to assure that the most economical and effective procedure is adopted.

The problem of how to shift facilities from one location to another is complicated by the fact that there is such a wide variation in the size and shape of railway structures. Water tanks, coal docks, icing platforms, stock pens, passenger stations, and bridges comprise a few of the types of structures that the railroads sometimes have to move to new locations, and each of these types presents a different problem in itself. Frequently, using modern material-handling equipment, the structure can simply be picked up bodily and carried to its new location. Sometimes the use of skids or rollers will suffice, but more often than otherwise it is not possible to reduce the problem to such simple terms.

An icing platform several hundred feet long is an example of a structure that cannot be moved by the simpler procedures. But one road that was recently faced with the problem of moving such a structure solved it by cutting the platform into sections, shifting each section onto a specially-built track-mounted carriage, switching the conveyance to the new location, and unloading the section onto the new foundation. Extensive stock pens and sheds at the location of a new yard being built by this road are being moved in essentially the same manner.

To dismantle a structure in moving it to a new location is a costly procedure not only because of the work involved but also because of the loss frequently incurred in the form of damaged parts that must be replaced. To move the structure intact requires more skill, more planning, and greater ingenuity, but the economies realized will more than compensate for the time and effort thus expended.

TAKING CHANCES—

May Mean "Track-Cause" Accidents

IF THE present year follows the pattern of previous working seasons, the report of at least one Interstate Commerce Commission investigation of a serious derailment will state that, prior to the accident, maintenance work was being performed which "rendered the track unsafe for train movements." If such a derailment should occur, few track foremen would care to be in the "shoes" of the man who was in charge of that work. Many of them, however, looking back, could rightly remark that, at one time or another, "There, but for the grace of providence, stood I."

All too many foremen have probably been rocked into insensibility by repeated chance-taking, which, luckily, has resulted in nothing more serious then "getting more work done." Otherwise, why do some foremen get into the habit of taking chances which flaunt the rules of safety and even of common sense? Only those who are guilty can answer this question, but it would be well, in the light of past accidents and the possibility of others in the future, for all foremen to reflect on whether chance-taking is worthwhile. Let them recall the times they may have gaged track and pulled the spikes from more ties than is permitted by rule. Let them ponder the times they have raised track without flag protection or slow order, and tamped a runoff too short to comply with the letter of their instructions. Yes, let them also think of the times they may have "gotten away" with other chance-taking. Then, let them visualize the havoc caused by past accidents, or that might be caused by future accidents, and resolve never to take another chance, for any reason, justifiable as it may seem.

And while those men are checking their past performances and making solemn resolutions, it might be in order for supervisory officers to do a bit of reflecting. They might consider, for example, the times they may have condoned chance-taking in their zealous desire for greater production. Perhaps it was the day "Joe" asked for a slow order to gage track and was denied it by the dispatcher—but still got the work done. How about that patch of bad ties that "Patsy" renewed on a sharp curve while raising track with a few men and no flag protection. Were these men, who probably shaded the letter of the rule and got the job done under difficulties, given credit for having "ingenuity", or were they censured for "taking a chance?" On the answer to this question may depend whether it will be Joe or Patsy who will be the "goat" in this year's "horrible" example—a track-cause fatal accident—or whether there will be any such horrible example.

Looking outward over the train shed during an early stage of the project. The area of the roof is about 170,000 sq. ft.

Reading Terminal Trainshed Gets New Roof

This view shows the poor condition of the old roof surface. The roof sheathing and purlins were also badly deteriorated

One of the largest balloon-type station train sheds still in service in this country—that of the Reading Terminal in Philadelphia, Pa.—has recently been given a new asbestos-felt roof surface, laid over new treated wood sheathing. At the same time the wrought-iron members of the structure were thoroughly cleaned and inspected and those which showed signs of weakness were repaired by electric arc welding. This work is herein described.

• Perhaps the largest roofing job carried out by a railroad in the country last year was that undertaken by the Reading in connection with a general program of improvements being carried out at its station and office building at Philadelphia, Pa., known locally as the Reading Terminal. This program involves the complete modernization and rearrangement of the building to permit more effective handling of the large number of commuters and through passengers using the station facilities. The roofing project, requiring approximately 170,600 sq. ft. of new roofing and sheathing, was carried out on the train shed and the concourse, directly north of the main building or head house. The surface of the new roof is of 20-year bonded asbestos felt and asphalt.

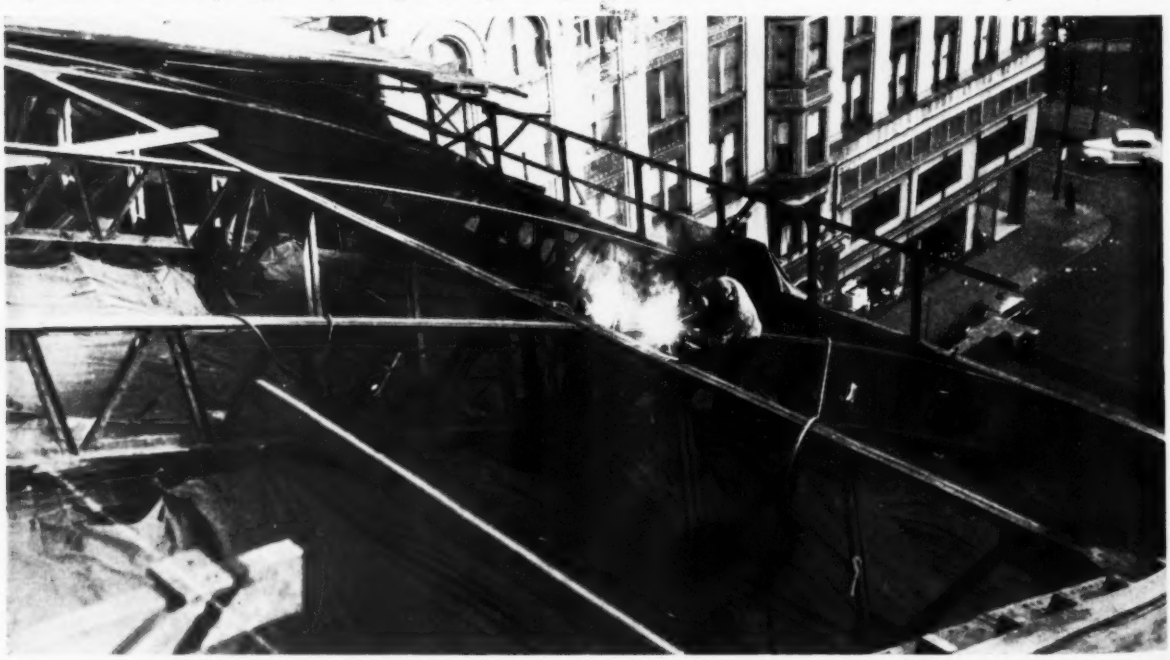
The train shed is a balloon-type structure, 501 ft. 8 in. long and 259 ft. 8 in. wide, spanning 13 station tracks, and is one of the largest such structures still in service. It is a three-hinged arch of wrought-iron construction, with a maximum height of 85 ft. above the track level, and was erected in 1892. The tracks of the terminal are elevated 23 ft. above street level and the area beneath them is leased for use as a market and for small business establishments. The concourse, 50 ft. by 260 ft., is located between the head house and the train shed. The roof of this structure is pitched slightly from the horizontal.

When built, the train shed had a tin roof covering, which was laid over 1-in. wood sheathing supported on 6-in. by 8-in. wood purlins. Daylight was admitted to the shed through windows in the side walls, and through six continuous longitudinal skylights in the roof—three each side of the center line of the structure. The construction of the skylights was such that they also served as ventilators to permit locomotive stack gases to escape from the shed. A longitudinal ventilator was located along the center line of the shed, between the two upper skylights. The glass panes of the skylights were held in place by iron bars which were encased in copper. Later, a monitor was erected above the center ventilator.

The tin of the original roof failed in a relatively short time and was covered with felt roofing. In subsequent roofing projects the tin was entirely removed. Difficulty was experienced with the skylights, which began to fail because of corrosion and electrolytic decomposition of the iron bars, and the original skylights were replaced by new ones, using wood bars and wire glass. Much breakage of the glass in both types of construction occurred because of extreme variations in temperature.

More recently, serious deterioration of the wood purlins and sheathing of the train shed was noted in many locations and it was feared that an unusually severe storm might cause the failure of the roof in at least some areas. Accordingly, it was decided to renew the roof completely, using fire-resistant wood, covered with a built-up roof surface.

The Reading electrified its Philadelphia suburban service in 1931, thereby effecting a substantial reduction in the amount of locomotive stack gases released in the train shed. Accordingly, in the current project, it was decided to eliminate, as no longer needed, the lower ventilator on each side of the structure by cutting away the supporting framework, and roofing over the openings. Furthermore, the glass of the skylights in the remaining ventilators was removed and the openings were sheathed and roofed. The ventilators, except for the one along the center line, had previously been



Above—Testing rivets of the wrought-iron supporting structure. The new purlins and sheathing, seen at the right, are treated with chromated zinc chloride to make them resistant to fire and decay. Below—All members of the roof structure were inspected and those requiring strengthening were repaired by electric arc welding

Above—Mopping the new roofing into place was made difficult by the steep slope of the roof. Below—View of the train shed when the roofing job was about half done

shortened by removing an 85-ft. section near the mid point of the shed.

Renewal of the roof was carried out in sections 50 ft. wide, running transversely across the shed, working from the south end of the structure. Prior to opening a section of the roof, a wire safety net, covered with fire-proofed canvas, was hung directly below the section, being wired to the arch ribs of the train shed at frequent intervals. In addition to serving as a safety net, this also directed any rain water falling through the opening in the roof toward the sides of the shed.

As the old roofing material and sheathing were removed they were lowered to runways laid in the wide gutters on each side of the train shed roof. This material was then carted to the outer, or north, end of the structure, where the smaller material was chuted to the track level for final removal from the site in cars. In some areas conditions required chuting the old material all the way down to the street level. Larger pieces were lowered with tackle.

Directly after the old roof was removed a 12-man structural gang moved in to clean, inspect and repair the wrought-iron roof-supporting members of the shed. This force tested and renewed rivets and strengthened any weakened members by arc-welding plates to them, where practicable. In some cases damaged members were removed and replaced by new ones.

When the structural repairs were complete, the carpenter forces laid new 6-in. by 8-in. purlins and 1-in. by 6-in. tongue-and-groove sheathing. This material was all treated with chromated zinc chloride to render it fire resistant and to protect against decay, the treating having been done by the Wood Preserving division of the Koppers Company, Pittsburgh, Pa.

The new roof surface is of the Ruberoid Company's Specification No. 200. It is a four-ply covering, consisting of one ply of asbestos base felt, covered with three plies of Air-Vent asbestos felt, each ply being broomed into hot asphalt. The entire surface was then covered with Ruberoid Cold Coating, using not more than 20 lb. per 100 sq. ft. The roof is bonded for 20 years.

The general contractor for the work was the Hauser Construction Company of Philadelphia. The roofing sub-contract was held by the George Duross Company, Philadelphia, which employed a force of 20 men on the work. The structural iron repair work was done by the Belfield Welding Company, Philadelphia.

This roofing project was carried out under the general direction of E. L. Gosnell, chief engineer of the Reading, and C. L. Wenkenbach, engineer of buildings. R. F. Wood, engineer of bridges, had charge of the structural work involved. The project was begun in the fall of 1947, but was discontinued for the winter of 1947-48 and was not completed until the past working season.

General view of the Pennsylvania's Diesel-electric sweeper car in operation

Typical condition of yard tracks before clean up

Pennsylvania

Sweeps Track with D

This article describes the construction and method of operation of a Diesel-electric track sweeper recently developed by the Pennsylvania for use in removing accumulations of front-end cinders, or engine sparks, car droppings and sand wherever they may occur in such quantity as to interfere with the normal maintenance and inspection of track.

• To assist in the effective removal of front-end cinders, car droppings and engine sand that often accumulate in quantity at numerous locations, such as in hump yards, on certain freight tracks over which thousands of loaded coal cars pass daily and, to a lesser extent on certain stretches of its passenger tracks, the Pennsylvania, a number of years ago, developed a mechanical steam - operated track sweeper. More recently it has developed a similar, though greatly improved sweeper, operating on power from Diesel-driven generators, which not only sweeps the track, but, through a system of electric-driven conveyors, loads the sweepings into hopper cars for shipment to disposal points. Used primarily on the Pittsburgh division of the road's Central region, the sweeper not only effectively removes the objectionable material, but does the work at substantial savings over hand-cleaning methods.

The earlier machine, which is still in operation, resembles a rotary broom street sweeper in many respects. It is a steam-operated unit mounted on a revamped flat car, and is pushed by a specially equipped locomotive which is used for both locomotion and furnishing steam for the sweeper. This unit embodies a rotary broom which sweeps dirt from the track onto a conveyor belt which, in turn, deposits it into an air-dump car coupled ahead of the sweeper.

New Diesel Sweeper

The new Diesel sweeper operates in work-train service, in a train, the consist of which, from front to rear, consists of a cabin, several hopper cars for dirt, the sweeper car, a power car, a tool and supply car, and a locomotive headed to push the train when in forward motion. The cabin car is of the type used by train crews in work-train service. The dirt cars are ordinary 100-cu. yd. revenue hopper cars, on which are located 100-ton capacity drag conveyors. The leading hopper car in the train, next to the cabin car, is not equipped with a conveyor and is used to collect dirt dumped into it from the conveyor on the next car to the rear.

The track sweeping car, which was constructed at the Pennsylvania's Altoona works, was placed in service in 1942. This car is of special design, with a platform floor over each of the trucks, while the space between is bridged by steel trusses. This construction provides an open area between the trucks and beneath the trusses in which the sweeping equipment is located. The principle elements of the sweeper car include a scarifier toward the front end to loosen the dirt in the track area, a broom assembly, and a system of initial conveyors to transport the dirt to the first of the dirt car conveyors.

The scarifier, which is located immediately back of the leading truck, is comprised of 18 curved strips of spring steel, each with a removable digging tooth. Four of these digging arms are located outside each rail, and ten lie between the rails. The scarifier as a whole is mounted on a transverse shaft or crosshead attached to the car platform and is connected through a crank and piston rod to an air cylinder mounted on the frame of the car. By means of control valves, one on each side of the car, air from the train line may be caused to enter the cylinder and move the piston, thereby imparting a rotary motion to the crosshead, which raises or lowers the scarifier blades. The cylinder connections and controls are arranged to

With passage of the sweeper train, all dirt is removed down to tops of the ties

Diesel-Electric Machine

provide a means of imparting a downward pressure on the scarifier blades to assure thorough loosening of the material in the track. When not in use the scarifier is locked in an elevated position clear of the track.

Sweeper Assembly

The main sweeping assembly of the car, which is enclosed in a heavy metal housing, includes a rotary broom, a drag conveyor into which the dirt is swept, and a system of initial conveyors to transport the material to the first dirt car conveyor. The forward end of the sweeping assembly is hinged to the underside of the truss car frame by means of a coupling bar and universal couplings, which provide for both vertical and lateral movement of the rear end of the broom assembly—the lateral movement being necessary to center the broom over the track on curves, irrespective of the position of the car frame above.

The rear end of the broom assembly, which contains the broom, is supported by two flanged wheels, which run on the track when in working position, in order to keep the broom in proper position, such as when working on curved track. Raising and lowering of the rear, or broom, end of the housing is by means of steel cables operated by an electric-driven hoist. When not in working position the broom end is raised to the maximum height and locked in that position.

The broom assembly is secured to the housing by means of two adjusting screws which work in vertical guides for raising and lowering the broom to compensate for wear of the broom bristles and different heights of rail.

The rotary broom itself embodies a metal shaft with a number of arms or brackets to which steel segments are attached by means of bolts to form a closed cylinder. The segments are perforated with properly spaced holes and the broom bristles, made of steel strips 1/32 in. by ¼ in. in section, are inserted in the holes. The steel bristles are cut 24 in. long and bent at the mid point to form a "U" shape 11 to 12 in. long. These U-shaped bristles are inserted through the holes in the steel segments and, when completely assembled, form a broom 8½ ft. long and approximately 3 ft. in diameter. There are three sections laterally to the broom, with space between them for the track rails when the broom is lowered into operating position.

Operation

When in operation the sweeper train travels at a speed of 2 to 2½ m.p.h., and the material on the track is effectively removed to a level slightly below the tops of the crossties. The broom, which turns at 100 r.p.m., sweeps the dirt into a drag conveyor, located slightly ahead of it, which elevates the dirt to a height of 3 ft. and deposits it in a lateral screw conveyor. This latter conveyor moves the dirt from both sides to the center of the car and deposits it into a receiver, from which it is moved by a drag conveyor and deposited onto the first dirt car conveyor. From here the dirt is moved via the dirt car conveyors to the car being loaded. These latter conveyors are so constructed that the

Another view of the sweeper working in a cut a short distance east of Pittsburgh

Dirt is loosened by these scarifiers which are held down by train-line air pressure

sweepings may be deposited uniformly over the length of the car being loaded, except in the case of the first hopper car back of the cabin, into which the dirt is loaded from the conveyor on the adjacent hopper car.

The rotary broom and initial conveyor on the sweeper car are operated by a chain, driven from a single electric motor. The second and third conveyors on the sweeper unit, also chain driven, are powered by separate motors, as are the drag conveyors on the dirt cars. The dirt car conveyors and the sweeping and conveying mechanisms on the sweeper unit are electrically interlocked so that they must be in motion before sweeping operations start. All power lines on the train are enclosed in rubber-covered cables, with weatherproof connections throughout.

All power for the operation of the sweeper unit and conveyors is furnished by the power car included in the sweeper train. This is a steel box car revamped to hold two 75-kw. generators, each directly connected to a 200-hp. Diesel engine to furnish direct current at 230 volts. Both generators are operated when the sweeper is working, being connected in parallel to met power requirements. Jumper connections and receptacles are provided at each end of the car to facilitate operation of the sweeper from either end.

Fuel oil for the operation of the Diesel engines is stored in a 1400-gal. tank on the power car, while a second tank of 150-gal. capacity carries the necessary supply of oil for lubricating purposes.

The tool and supply car in the train, which is a converted box car, is equipped with mechanical devices for the construction of the broom, as well as with tools and parts for repairs to the entire equipment. The car also houses a small gasoline-engine-driven generator to supply lights for illuminating night work within the car.

At the close of each day's operations the loaded dirt cars are set out and empty cars are set in—the conveyors being transferred from the loaded to the empty cars by means of a pillar crane of 10,000-lb. capacity, mounted on the rear of the sweeper car.

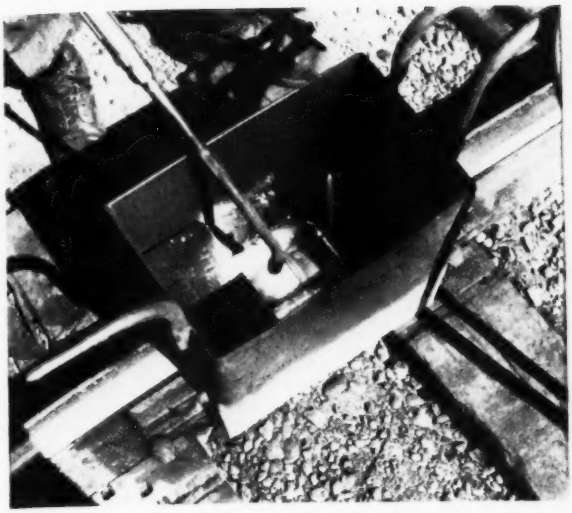
The regular force required to operate the sweeper consists of a foreman, a work equipment engineer, a maintenance-of-way repairman, and a machine operator. Since it is a regional unit, in seasonal operation on several divisions, a camp train consisting of a kitchen-diner, a 10-man sleeping car, and a recreation car is assigned to the sweeper train.

Efficient operation of the sweeper train is the direct responsibility of the supervisor of track on whose territory it is working. He makes the necessary arrangements in advance with the operating department, advising them of the daily cleaning program, so that delays to the sweeper and interference with normal train operations are reduced to a minimum.

The track sweeping operations on the Central region are carried out under the general direction of L. E. Gingerich, chief engineer maintenance of way of the region, and the various division engineers of the divisions to which the sweepers are assigned.

Canadian Pacific Foremen at Montreal Get Safety Awards

THE effectiveness of the Canadian Pacific's safety program among employees was underlined recently when certificates were presented to 15 foremen on the Montreal Terminals division for a five-year record of no accidents in their gangs. Since 1945, when the railway's present safety program was instituted, reportable injuries on the Montreal Terminals division have shown steady decline—from 330 in 1945, to 124 in 1948. Shown here at the presentation ceremony are, left to right, front row—J. H. Duschesnay, yard foreman; A. Bergeron, yard foreman; Guy N. Curley, general manager, Eastern region; A. H. Holland, yard foreman; H. Beaulieu, yard foreman; H. K. Parks, signal maintainer; and F. X. Saulnier, bridge and building foreman. Top row—A. Hogue, bridge and building foreman; G. Benoit, district safety agent; J. C. McCuaig, general safety agent; J. W. Harmon, superintendent; F. A. Pouliot, general superintendent; and J. A. Ouimet, bridge and building foreman.



Recently the Chicago & North Western started the use of a method of heat treating rail ends in track in which hand torches are used in connection with baffle boxes to protect the flame from the wind. This method is proving both flexible and economical. As a result the road is realizing substantial savings in the cost of this work. This article describes the procedure and equipment used in the baffle-box method and tells how the savings in the cost of the work were accomplished.

Above—Using one baffle box, a crew can flame harden about 400 joints per day. Upper Left—Inside the box the flame impinges on the rail-end surfaces in a gap between two fire bricks

Baffle-Box Method Reduces End-Hardening Costs

Before flame hardening, the rail ends are ground to speed heat penetration

• For a number of years it has been the practice on the Chicago & North Western to flame harden the ends of all new rail laid in track. Recently the road succeeded in reducing the costs of this work as much as 30 per cent by replacing the machine method of flame hardening by a hand operation involving the use of baffle boxes developed by the Oxweld Railroad Service Company. It has found the latter method highly flexible and economical, requiring two less men than the machine method, yet producing results fully as effective.

How Baffle Boxes Are Used

In the baffle-box method of flame hardening the oxyacetylene flame, applied by a hand torch, impinges on the running surface of the rail ends inside a steel box which protects the flame from the adverse effects of the wind. The box has an opening in the bottom that conforms closely to the contour of the jointed rail. Thus, when the box is in position at a rail joint its sides straddle the rail, providing side curtains against drafts. The sides and ends of the box project high enough above the top of the rail to provide good protection against the wind. Inside the box the running surface of the rail is covered by fire brick except for a 4-in. gap which exposes about 2 in. of each rail end to the heat of the flame. Handles are provided for moving the box from one joint to another. The oxygen and acetylene tanks are carried on a push car

When flame hardening rail ends with the bond wires in place, the wires are protected by an application of asbestos paste

Close-up view of a finished joint showing the pattern of the hardened area. The asbestos paste had not yet been removed

which is pushed along as the work progresses.

In carrying out the flame-hardening work the rail ends are first ground with a flexible shaft grinder to remove mill scale and to produce equal rail heights at the joints. Then, with the box in place the flame is directed at the top surface of the rail head for a stop-watch-measured period of time, usually 35 sec. Of this time 20 sec. are consumed in heating the central portion of the exposed running surface of the rail and the remaining 15-sec. period is used in a finishing operation in which the flame is moved in a figure 8 pattern. When flame-hardening rails with the bond wires in place, the wires are protected by an application of asbestos paste, which is removed after the joint is finished. When the work is done behind the rail gangs, this operation, of course, is not necessary because the rails are flame hardened before the bond wires are applied.

Crew Required

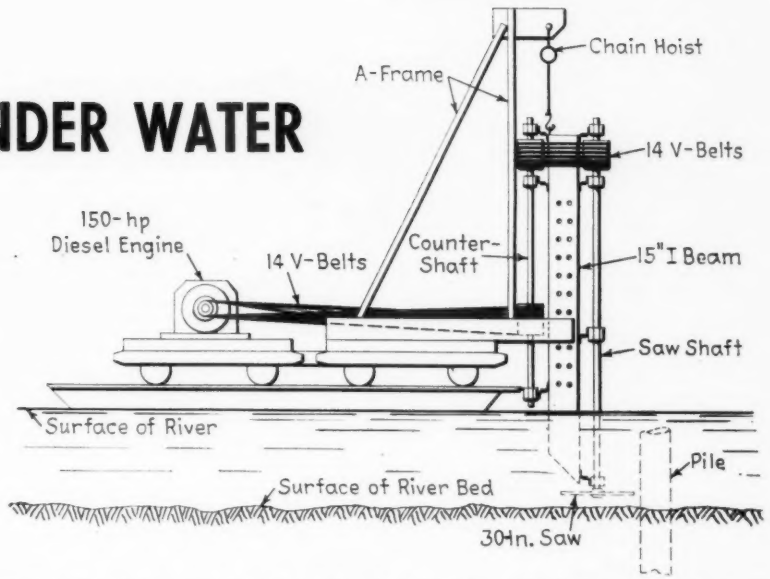
Flame hardening by the baffle-box method usually requires a crew of five men—a welder, a helper, a grinder operator and two laborers to handle the push cars and to remove equipment from the track when necessary. If the work is done under traffic two additional men are required to act as flagmen. Because of the high rate of production possible it is necessary to use only one baffle box to keep up with the progress of a large rail gang. In one instance, for example, a crew with one baffle box flame hardened the ends of 458 rails laid in one day. Average production is about 400 joints per day. Small gangs cannot lay rail fast enough to keep ahead of the flame-hardening work. Therefore, it is more economical to flame harden rails laid by small gangs under traffic at a later time. In such instances the baffle boxes are sometimes used in pairs to increase production.

Flame-hardening operations on the North Western are carried out under the general direction of L. R. Lamport, engineer of maintenance, and J. P. Datesman, engineer of track.

Corrosion-Proof Drainage System for New Tunnel

WHEN drilling a 1,500-ft. tunnel in connection with the recent construction of a nine-mile spur track to undeveloped coal reserves near Philippi, W. Va., the Baltimore & Ohio was confronted with an unusual drainage problem owing to the fact that the bore of the tunnel passes through an abandoned coal mine. During the construction work approximately 25 haulways or mine rooms, many of them filled with water containing a large amount of sulphur, were encountered. Consequently it was necessary to devise a corrosion-proof drainage system that would protect the concrete lining of the tunnel from deterioration. This problem was solved simply by the construction of a tunnel drainage ditch, the invert of which is lined with half-round vitrified clay pipe. The extension of this ditch from the east portal of the tunnel is also lined with vitrified clay pipe, as shown in the photograph.

Special Saw
CUTS PILES UNDER WATER



Sketch of under-water pile saw developed on Richmond, Fredericksburg & Potomac

A machine homemade by the R. F. & P. speeded the removal of an old trestle from a navigable stream

• During 1947 the Richmond, Fredericksburg & Potomac completed and placed in service over Aquia creek, about five miles south of Quantico, Va., a new concrete and steel bridge, 1,321 ft. long, replacing a steel trestle of approximately the same length which had far outlived its normal term of service. At the same time the approaches to the stream crossing were relocated so as to improve the alinement, resulting in the new structure being located 42 ft. downstream from the old.

Because the stream is navigable and is widely used by fishing and pleasure craft, the War Department required that the old trestle be completely removed and that the piles within 100 ft. each side of the center of the established channel be cut off eight feet below low water. All other piles of the structure were to be cut off at the mud line, which in most cases is between two feet and six feet below low water. This project, which involved approximately 4,000 piles, most of which were 15 in. in diameter at the butt, was undertaken by the road's carpenter forces.

As the old trestle was dismantled the timber caps were removed from the piles, leaving the tops of the piles at the low water line. The tide range is about 1.5 ft. The removal of the piles presented a more difficult problem and required the use of special equipment. After a number of experiments, the R. F. & P. developed a home-made machine, mounted on a floating deck, which proved fully capable of performing this task.

This device embodied a 30-in. circular saw, located in a horizontal position at the lower end of a vertical shaft which, in turn, was attached through bearings to a 15-in. I-beam arranged for raising and lowering as dictated by the depth of water. This equipment and the power plant for operating it were mounted on two push cars, which, in turn, were mounted on tracks laid on a 12-ft. by 20-ft. working deck formed by lashing two small barges together.

One of the push trucks supported the power plant—a General Motors 150-hp. Diesel engine, equipped with an outboard bearing at the end of its take-off shaft. Driving motion was transmitted to the saw by means of 14 V-belts moving over two seven-sheave pulleys on this shaft.

The saw mechanism was supported on the second of the push cars. This mechanism consisted of the main saw shaft, 16 ft. long, the 15-in. supporting I-beam, which was 14-ft. 5-in. long, and a 12-ft. countershaft, located on the opposite side of the I-beam from the main shaft and, like the main shaft, attached to the beam member through thrust bearings.

This entire saw mechanism was suspended from a chain hoist, which, in turn, was supported by a steel A-frame erected at the front end of the car and anchored to the car frame. Located on and projecting from the front end of the car was a steel guide, which not only served to hold the I-beam and its attached shafts in a vertical position but also provided a means of securing the mechanism in position while piles were being sawn.

Two seven-sheave pulleys were keyed to the countershaft and were driven by the 14 V-belts which comprised the main drive. They keyway for this pair of pulleys was 7 ft. 9 in. long to permit them to remain at the proper level, regardless of the elevation to which the saw assembly was raised or lowered. Both pulleys were supported by a thrust bearing attached to the guide.

Final drive of the saw shaft was accomplished by means of similar two-pulley V-belt assemblies at the top of the countershaft and the saw shaft. The saw was attached to the lower end of its shaft by means of collars, a jamb nut and a lock nut.

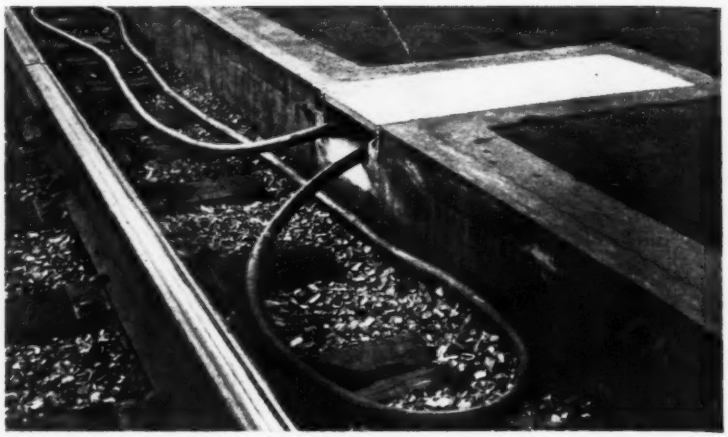
The push cars were coupled together rigidly so as to maintain the proper tension in the main drive belts. Proper lateral alinement of these belts was obtained by off-setting, as necessary, the tracks supporting the two push cars.

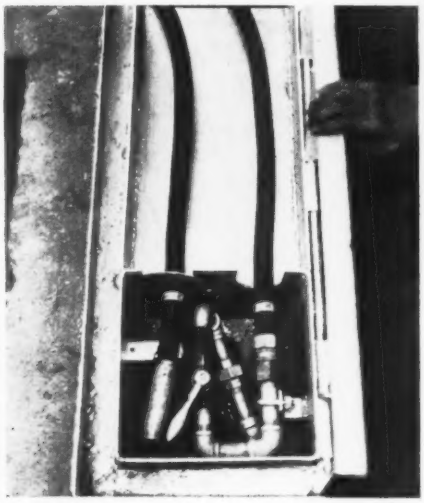
When sawing operations were underway, the barges were secured in position by four anchor lines, with the saw blade immediately adjacent to the pile to be cut. With the saw operating at full speed, two men pushed on the cars, moving the entire assembly forward until the saw was in contact with the piles. Continued pushing of the cars forced the saw blade through the pile.

This arrangement proved to be highly effective, as is indicated by the fact that as many as 86 piles were sawn in nine hours. The entire job was completed in 106 days, using a force of nine men. When the project was finished the saw was dismantled as the road contemplated no further work of this character.

This project was carried out under the general direction of E. M. Hastings, chief engineer of the R. F. & P., J. C. De Jarnette, division engineer, and J. C. Davis, supervisor of bridges and buildings.

Right—The covers of the boxes are made flush with the platform surface to eliminate the danger of tripping over them. Below—One of the boxes with the cover raised. Note the troughs to prevent surface water from entering the box proper





Water Service Box for Station Platforms

• A new design of covered flush-type water service boxes, intended primarily for use at stations where through passenger trains are serviced while station work is performed, have been installed recently by the Norfolk & Western—first at the station at Bristol, Va., and, more recently, at Roanoke. The design of the boxes is such as to minimize the danger of contamination of the drinking water supplied to coaches and is in conformity with the regulations of the United States Public Health Service governing coach-watering facilities.

The boxes are of welded steel-plate construction. When installed, each box is recessed into the platform so as to be flush with the platform surface, with one end of the box in line with the edge of the platform. The boxes are located along both sides of inter-track platforms to eliminate the need for crossing the platforms, or tracks, with coach-watering hose, thus eliminating an accident hazard. The interval between adjacent boxes is approximately 70 ft.

Specifications call for the boxes to be 13½ in. wide and 40½ in. long. They are divided into two sections, one section being 13½ in. square and 18 in. deep, while the other section, 13½ in. by 27 in. in plan, is open at the outer end and varies in depth from 4 in. at the inside end, near the deep section, to 5 in. at the outer end. A steel plate with two slots, each 3½ in. wide and open at the top, separates the two sections.

The water supply line—a 1-in. galvanized steel pipe — enters the bottom of the deep section. By means of a series of fittings, including a Murdock cut-off valve, the supply line is brought to a horizontal position near the top of the box where a fitting provides for connecting a 50-ft. length of 1-in. hose for delivering the water to the supply tanks of coaches.

Drainage of the water boxes is to a storm sewer. A 4-in. cast-iron drain pipe that is capped by a cast brass strainer enters the bottom of the deep section. After the box is installed and all connections are made, the entire box floor area around the strainer is paved with concrete, sloping from all sides toward the strainer so as to direct waste water into the drain.

Steel angles, 2½ in. by 3½ in., are welded near the top of the outer faces of the box sides and the deep end, to form a continuous trough around three sides of each box. Thus, when the box is installed, surface water from the platform will drain into the trough, rather than into the box proper. By locating the open end of the box at the edge of the platform, the water in the trough is directed into the track area.

A hinged cover, made of Alan-Wood Super Diamond plate, is provided for each box, the design being such that when the cover is in the closed position both the box proper and the troughs are covered. Each box was painted with aluminum paint before being installed.

From its connection to the supply line in the deep section of the box, each coach-watering hose passes through one of the slot openings in the plate separating the two sections and is laid through the shallow section to reach the track area. The free end of the hose is covered with a metal cap, 6 in. long, which may be removed readily, and a metal disk, 6 in. in diameter, is affixed to the hose about 8 in. from the end to prevent the end from touching the ground. The metal cap is attached to the disk by means of a short length of light chain. When not in use, the free end of the hose is placed in the box, being laid in the second slot opening in the section-separating plate, with the tip of the hose resting on a support.

The open end of the box at the edge of the platform makes it easy for a workman to take hold of the cover and open the box. Therefore, no handle is provided.

These water boxes were developed by A. R. Slusher, shop engineer of the N. & W., Roanoke, Va. The satisfactory performance of the first installation at Bristol led to a more extensive installation at Roanoke and the box has now been adopted as standard by the road. The installations at both locations were made under the direction of H. F. Smith, engineer of bridges and buildings, and under the general direction of A. B. Stone, chief engineer.

To Those Who Supervise—

A list of helpful suggestions and ideas which, with a knowledge of on-the-job conditions and a generous measure of common sense, should enable supervisory officers to obtain maximum results

The 40-hour week starting September 1 will increase the importance of good supervision

THE SUGGESTIONS and ideas embodied in this article are taken from a booklet compiled by the Illinois Central and put into the hands of all supervisory employees in the engineering and maintenance of way and structures department. In a foreword introducing the booklet, C. H. Mottier, vice president and chief engineer, says in part: "The importance of the supervising officer cannot be overestimated. He represents the railroad to the public and to the men he supervises, and he represents these men to the officers who supervise him. In large measure, the character and actions of the supervisor, within his sphere of influence, create and reflect the reputation of the railroad. If he fails to shoulder his full responsibility, both he and the railroad will suffer." The contents of the booklet are presented in abstract form below.

Introduction

(1) Supervision—the judicious use of people and equipment to get work done—is an important part of management.

(2) The term "supervision" implies the centering of responsibility. As used in the following, it is not the title of a particular job, but rather is used as a descriptive term of all positions supervisory in nature, regardless of title.

(3) This booklet is for the guidance of supervising officers. It does not enumerate all of their duties and responsibilities.

(4) While it is true that the management of small business may be handled satisfactorily by a few officers, it is likewise true that the supervisory capacity of any one individual is limited. Consequently, in a large organization such as a railroad, there must be several levels of management.

(5) The position of supervisor, like that of president, is a part of management. These positions differ only in scope, the number of persons supervised, and the number and type of activities. In other words, it is the degree and extent of responsibility that distinguish between the several positions in management. Although the extent of responsibility becomes increasingly greater in the successive levels of supervision between the small unit head and the president, the direction and disposition of the responsibilities remain the same.

(6) There should be close understanding between those who supervise and those who work under them. The greatest asset of any business is the people who work for it. A supervisor can do much to aid in making the most of that asset.

(7) Curiosity is one of the permanent and certain characteristics of an active, vigorous mind and serves to counteract an outstanding human weakness—the resistance of the mind to new ideas.

(8) Whatever ability a supervisor has for understanding and handling men should be cultivated to increase his value as a supervising officer.

(9) To obtain the best results from his efforts, one who exercises supervision over others should develop certain qualifications, among them leadership, enthusiasm, exemplary conduct, punctuality, a neat appearance, alertness, resourcefulness, tact, diplomacy, honesty, and the ability to visualize, to organize and to make prompt decisions.

(10) Supervisors should be able to give quick, accurate instructions.

(11) Supervisors should be leaders, not mere drivers.

(12) A good supervisor should endeavor to deserve and hold the respect of his men.

(13) When things go wrong or confusion exists, a supervisor must do his best to be patient, calm and collected.

(14) A supervisor should have a thorough knowledge of the job and the ability to put the knowledge into practice in a manner that will impress his subordinates favorably. He should have sufficient knowledge of psychology to be able to appraise the ability of the men under him and to decide which method of instruction and correction will best suit each individual. He should be able to exercise initiative and ingenuity in handling personnel.

(15) A supervisor should exercise simple dignity in all dealings with or about subordinates. He should be fair and impartial in representing subordinates to superior officers and never, as a face-saving gesture, permit a subordinate to shoulder blame for any rule violation, oversight or other dereliction for which the supervisor himself or some one else is responsible.

(16) Capacity for growth, development

within his organization, and a continuing consciousness that a better way may yet be found are essential.

Ability to Think

(17) A supervisor should cultivate the ability to think for himself.

(18) There are two kinds of thinking; one, emotional; the other, intellectual. Emotional thinkers let their feelings decide; intellectual thinkers let the facts decide. The supervisor should be an intellectual thinker.

(19) Supervisors should remember that they sometimes need friendly advice from someone with more knowledge or experience. When a person ceases to study he ceases to grow. The most expensive thing in life is ignorance.

(20) Education by study, observation and experience should continue throughout one's career.

(21) The caliber of the supervisor can usually be measured by the work of his men. Neither skill nor leadership is required to dismiss a subordinate, but the officer who can convert an inefficient or contentious employee into an efficient or contented one demonstrates that he possesses the qualities for successful leadership.

(22) There is opportunity for advancement as vacancies occur for those who demonstrate the intelligence, ability, energy, personality and ambition for greater responsibility and higher position.

(23) Either praise or criticism produces better results than neither, but the way to develop the best in anyone is by encouragement and expressions of appreciation.

(24) A fair and friendly attitude in dealing with subordinates and associates will inspire confidence, promote harmony, make work easier and result in better work.

(25) Those who believe in and have enthusiasm for railroads and are willing to work make the best employees.

Duties and Responsibilities

(26) Among the more important duties and responsibilities of the supervisor is the instruction of employees in safe and proper methods of performance of their duties as provided in the Rules and Regulations of Maintenance of Way and Structures, Safety Rules and other rules or special instructions, together with the supervision of their work to insure compliance.

(27) No less important than the supervisor's responsibility to management is his responsibility to his subordinates. In many cases the supervisor personifies the railroad to those under him, who often think of themselves as working for their immediate superior rather than for the railroad. An impartial, cooperative attitude toward those under supervision will do much to insure employees being loyal and faithful to the supervisor and the railroad.

(28) A supervisor should always give full credit to the proper person or persons for constructive ideas or creative work and should neither seek nor accept credit that belongs to a subordinate.

(29) The responsibility for building morale among employees rests upon the supervisor more than anyone else.

(30) A supervisor should study conditions on his territory so that he may discover and correct improper practices and effect or recommend changes that will increase efficiency, bring about greater economy or improve operation or maintenance.

(31) Stations and other buildings should be inspected at every opportunity, and particular attention paid to fire hazards, wash rooms, toilets and drinking water.

(32) Poor housekeeping or the presence of fire hazards observed anywhere should be called to the attention of the officer having jurisdiction, with a view to eliminating any that may be found.

(33) In connection with performing his own duties, a supervisor should observe the operations of other departments and their supervisors, especially those which affect his department.

(34) A supervisor should familiarize himself with the railroad's obligations under the working agreements covering employees under his supervision, so that he will know the extent to which such agreements affect work in his territory.

(35) Of great importance in preparation for further promotion is the experience gained in one's present position.

(36) Initiative and ability are very important qualifications, and their development should be encouraged.

Planning Important

(37) Careful planning is the responsibility of supervisory officers.

(38) Work should be so handled as to interfere as little as possible with other departments, and particularly train movements.

(39) Work should be so planned and materials for it so ordered that it can be carried out without over-supply or delays, both of which cause extra expense. Orderly and efficient thinking and planning will be reflected in the quality and speed of completion of the work.

(40) When in stations or while on trains any condition seen that should be corrected for the betterment of service should be called to the attention of the agent or conductor or reported to the trainmaster.

(41) A supervisor should keep in touch with other departments, especially with respect to problems requiring joint action, making it his business to know the problems of other departments in his territory and to call attention to matters with which they may be concerned.

(42) Any contemplated industrial development that comes to the attention of a supervisor should be reported.

(43) Correspondence should be handled promptly.

(44) Superior officers should be kept informed of current conditions and of all important or unusual matter occuring in a supervisor's territory.

(45) Frequent personal inspections of assigned work equipment must be made by the supervisor in charge.

(46) New employees generally are either inexperienced or deficient in railroad experience. Statistics show that the greatest labor turnover is with new employees. One of the principal reasons for this is that they, particularly if working for the first time, experience difficulty in adjusting themselves to the strangeness of their new surroundings or new job. It is important, therefore, that supervisors have a sympathetic understanding of the bewilderment new employees frequently experience and use patience and care when instructing them in the proper performance of their duties.

(47) Observation of subordinates will disclose which are eager, willing and competent, as well as those who tend to be trifling, unreliable and incompetent. The latter type presents a challenge to a supervisor's leadership and ingenuity.

(48) As an instructor, a supervisor should remember:

(1) If the pupil hasn't learned, the teacher hasn't taught. The requirements of effective teaching are:

(a) Telling how to do the job.

(b) Demonstrating how to do the job.

(c) Checking to see that the job is done correctly.

(2) Oral instruction alone is not always sufficient because:

(a) There are variations in the ability of pupils to absorb oral instruction.

(b) Words may confuse and make the job seem more complicated than it is.

(c) Some pupils are "eye-minded" rather than "ear-minded."

(d) It is not always possible in words to make some operations clear.

(3) Demonstration alone is not always sufficient because:

(a) The hand is quicker than the eye.

(b) Many motions of a teacher are difficult to imitate.

(c) Key points may be missed.

(d) Pupils may have wrong angle of view.

Respect for Subordinates

(49) A supervisor, when discussing a man's shortcomings with him, should be impersonal, endeavoring to make him understand that it is the offense—not the man—which is condemned. Regardless of the circumstances, respect for the offender's personal dignity should be shown. Rule requirements and violations should be pointed out calmly. Displays of anger or irritation should be avoided.

(50) When an employee needs correction for any cause, it should be done privately. Censuring one in the presence of others generally causes resentment and probably lowers his value as a workman. Employees should not be made to appear ridiculous.

(51) To insure respect for himself and his opinions, a supervisor must respect subordinates and their opinions. An absurd attitude of dignity or aloofness, overfamiliarity toward subordinates or easy-going tolerance of inefficiency invites contempt and disrespect.

(52) Kept promises are often forgotten; broken promises, never.

(53) Subordinates should be congratulated on their good fortune, sympathized with in their sorrow and misfortune, and given helpful counsel when they are in trouble.

(54) Due praise for work well done should be given a man in the presence of his fellow employees. Everyone likes to have his effort and accomplishments appreciated and will endeavor to continue to merit commendation. An outstanding service should be especially commended.

(55) Every member of the organization owes it to himself, his fellow workers and his railroad to call to the attention of the offender and, if necessary, later to report, any misconduct or negligence he observes that adversely effects the interest of the railroad. To perform this duty conscientiously and fairly will prevent further violations which, if passed unnoticed, will not only bring trouble to the violator himself but frequently involve his associates also. Withholding such information can only be interpreted as proof of negligence or indifference.

Encouragement

(56) Employees should be encouraged and aided to become fully competent in their present positions. Where initiative and ability are shown, they should be urged to further study and effort to prepare themselves for promotion.

(57) The attention of subordinates should be called to the fact that happiness in one's work comes with proficiency and that all enjoy doing the things they do well, whereas it is usually a drag to do things poorly.

(58) Supervisors should make, and should encourage their men to make, suggestions for improving service or safety conditions, increasing efficiency or effecting economy, and should see that proper credit is given whenever ideas are adopted

(59) A supervisor's loyalty to his men will do much to promote loyalty to the railroad.

(60) A supervisor's success depends to a large extent upon the loyalty and efficiency of those working under him.

(61) Someone else may be superior in some one trait; so be tolerant.

(62) Every employee should be encouraged to be a booster for railroad service, particularly for that of his own railroad.

(63) Privileges should not be granted to any one worker, except as they are in harmony with the privileges of his fellow-workers.

(64) The most beneficial thing a leader can do for his men is to set a good example; deeds go farther than words.

(65) Knowledge is of benefit to no one unless utilized.

(66) Decisions should not be made until all circumstances and facts are known; then the orders needed should be given and required to be obeyed as promptly as practicable.

(67) Arguments should be avoided.

(68) Careless or slipshod methods must not be permitted.

(69) In achieving results, nothing can take the place of cooperation.

(70) It is important that all men be treated fairly and with patience and firmness. Any display of favoritism or prejudice should be avoided if full cooperation is to be obtained.

(71) Necessary instructions must be given to all men who must keep records or make reports.

(72) Progressive supervising officers may increase their value in present positions and chances for promotion by the information gained from membership in supervisors' clubs or national railway associations.

(73) An important essential is to know the rules thoroughly. They should be reviewed frequently and classes for instruction attended when available.

(74) Teamwork and compliance with the rules are the responsibility of all.

(75) It must be impressed upon subordinates that a railroad must be run according to definite rules; that every rule is important, with a good reason for its existence, and that compliance with each is of first importance.

(76) Supervisors are responsible for enforcement of the rules and must make frequent tests to be sure that employees are complying with them. The extent to which rules are not enforced or properly applied is usually reflected in the number of hazards or avoidable accidents.

(77) When instructions, plans and rules are not followed, the matter should be handled promptly with the offending employee while the circumstances are fresh in mind, so that the reasons may be clear for any action or discipline that may be required. If a formal investigation is necessary, it should be conducted promptly and in accordance with schedule agreements.

(78) Failure or laxity in correcting rule violations may have very harmful results, as it may encourage employees to develop careless habits of thinking and acting, since they may be left with the impression that no violation has occurred. Most damaging of all, from the standpoint of morale, they may come to feel that the supervisor does not recognize a violation when he sees it or, recognizing it, is willing to overlook it.

(79) It is good practice to ask questions designed to develop whether or not each employee possesses a proper knowledge of the rules and how to apply them. If replies are satisfactory, the employee should be commended; if unsatisfactory, appropriate steps should be taken to clear up all points on which the employee may be uncertain, misinformed or ignorant.

(80) Employees may occasionally request interpretation of certain rules. In such cases no interpretation should be given without reference to the book unless one is thoroughly familiar with the rule or rules in question.

(81) When an interpretation relating to an actual occurrence is requested, all the facts should be known before an opinion is given. Care must be exercised in applying the rules to hypothetical situations. If the request for interpretation is one which cannot with certainty be answered, the inquirer should be informed frankly, and the correct answer should be given later, after the supervisor has received it from his superior officer.

(82) Employees on duty should be discouraged from indulging in idle conversation, story-telling, pranks or other practices which may take attention from their work.

(83) When accidents or other irregularities occur, appropriate steps must be taken to prevent recurrence. Many times this will require a formal investigation, the purpose of which is to determine all the relevant facts. Questions pertinent to the case should be asked in a manner that will place all such available evidence into the verbatim record.

(84) Whenever consistent, the officer conducting an investigation should visit the scene of the occurrence under investigation and study the circumstances at first hand prior to conducting the formal investigation. He should discuss the circumstances with officers and employees who have knowledge of the facts, and he should do so while the subject is still fresh in their minds.

Accident Prevention

(85) To reduce the number of accidents an effective means of impressing proper procedure upon the minds of employees is to quote or call attention to specific rules. This should be done frequently.

(86) Few accidents occur that are not traceable to human failure. Prevention of accidents can best be accomplished by diligence in teaching employees safe and proper methods of performing their work and in correcting rule violations, unsafe conditions and improper practices.

(87) Where conditions are such that human failure can cause an accident, sooner or later an accident is almost certain to occur. Supervisors should therefore be on the look-out for such situations, so they may be eliminated as promptly as possible

(88) Generally, accidents reflect the character of supervision.

(89) When accidents do occur that should have been avoided, special effort should be made to impress employees with their responsibility in preventing similar accidents.

(90) Supervisors should be on the alert for defects, unsafe conditions, or inefficient or unsafe methods of performing work in any department and should handle for correction either personally with the employee at fault or with his immediate superior.

(91) To promote safety is always important.

(92) The beneficial results of frequent interchange of constructive suggestions and ideas and friendly discussion with officers and employees of all departments on possible improvements in the service will be reflected in the character of service rendered to patrons and in the volume of business of the railroad.

(93) Courtesy (considerate behavior toward others) should be a habit. It is the foundation of both public and personnel good will.

Service to Patrons

(94) The only thing the railroad has to sell is service. To attract and hold adequate traffic to meet payrolls and other expenses, the railroad must have the confidence and good will of its friends and neighbors. To create and maintain this confidence and good will, particularly in the face of severe competition, requires service that is conspicuously courteous and efficient. To do just enough to "get by" is not sufficient.

Getting the Most

In this article, which is adapted from a paper presented before the annual meeting of the American Wood-Preservers' Association in St. Louis, April 27, the author first stresses the importance of timber conservation to the railroads and of holding down bridge and trestle maintenance and renewal costs, and then, based largely upon the practices of the Southern, describes a number of expedients employed to that end. These expedients include the use of drive dowels in bridge and trestle ties, caps and posts, to minimize checking and splitting; the drilling of 1/2-in. holes in the tie plate areas of trestle ties to insure drainage and thorough treatment in these areas; and the application of gum bearing strips to trestle caps

A creosoted ballast deck trestle on the Southern, designed for a long service life

• The railroad industry is vitally concerned with the preservation of timber. The amount and quality of timber formerly used are no longer available. Substitution of species has become necessary. As a result of the change in character of supply, more consideration must be given to timber preservation to obtain a longer life to offset the decrease of available material and corresponding increase in its cost.

Railroad experience with creosoted lumber soon developed the fact that longer life of the material could be obtained by preframing and preboring it before treating. This has necessitated the preparation of plans as well as the forecasting of needs to obtain the lumber at the required time.

Bridge Ties

Originally it was felt sufficient to provide bridge and trestle tie details alone for the dapping for stringers. Later, rabbetting or grooving for rivet heads was deemed necessary. While the softness of shortleaf pine proved that this was unnecessary, since the treated shortleaf pine ties crushed down over the rivet heads when the first engine passed over the track, the hardness of red oak made this extra work of preframing essential. Notching for lateral plates of steel deck girders or stringers became necessary so that the tie could not throw a load on these plates for which they were not designed.

The bridge tie for superelevated track presented the additional problem of finding lumber of sufficient depth to support the rails adequately. For light superelevation, the tie can be made from one piece by beveling the top of the tie to the slope desired. For heavy superelevation, it is necessary to make the tie of two pieces or to provide a sleeper on the top of the girder or beam flange nearer the high rail to take up the differential in depth caused by the track superelevation. Both methods have been used by the railroads, each justified by certain advantages over the other. The two-piece tie does not require the knocking out of rivets to permit bolting the sleeper to the supporting girder or beam flange, nor does it require the counter boring of numerous holes in the sleeper to fit a flange studded with rivet heads. The sleeper, on the other hand, does not require the fastening together of the two pieces making up the two-piece tie in such a way as to prevent any slippage at right angles to the track.

Stringers and Caps

The trestle stringer does not require much framing at the mill. To utilize the full value of horizontal shear in the stringer, sizing has to a large extent replaced dapping. Vertical holes for drift bolts are usually provided, but holes for chord bolts must be drilled in the field since no practical method at a reasonable cost has been found to bore holes through stringers which will match the holes in adjacent stringers. Since the horizontal chord bolt holes can be treated with hot creosote oil in the field and there is little danger of water working into these holes, it appears that the field boring of chord bolt holes will be continued. The importance of cutting the stringers to exact length should not be overlooked, especially where the stringers abut each other.

Trestle caps which bear on piling are subjected to more punishment than any other kind of bridge and trestle lumber. Therefore, it is essential that every effort be made to insure a condition of installation which will not adversely affect the cap. Dapping for the piles, formerly done, has been replaced by sizing to insure a uniform cross section throughout the piece of lumber. The side showing the most heart wood should be placed downward against the piles to avoid as much as possible the punching of the piles into the cap. The boring of drift bolt holes from the bottom of the cap is necessary to obtain assurance that the drift bolts will drive into the piling or posts satisfactorily without having to rebore them later in the field.

Out of Bridge Timber

By E. S. BIRKENWALD
Engineer of Bridges, Western Lines, Southern
Cincinnati, Ohio

Trestle posts require cutting to exact length and bevel in order to fit properly in the field. Allowance must be made by the mill for the saw scarf in order that the length of the post will be accurate. A slight error in bevel for a batter post results in poor bearing which, if permitted to exist, soon would cause deterioration of the contiguous lumber by crushing and later from moisture collecting at the point of bearing. At first, it was thought necessary to bore the posts for bracing bolts. However, this proved impractical, since it was found that the holes bored were not sufficiently accurate to accomplish a good fit.

Creosoted piling, while requiring no framing at the mill, needs special treatment in the field to preserve its life. After the piling has been driven and then cut off to proper elevation, a mud ring about one inch high is placed on the top of the pile and hot creosote oil is poured into the ring. Sometimes the pile will absorb as much as four pourings, equivalent to one-half gallon. Then the pile is sealed with hot pitch, thinned with creosoted oil if necessary, on top of which is placed a 20-gage sheet metal cover to protect the pile end still further. Sometimes it has been found more convenient to use metal rings, about one inch high, of various diameters to fit varying sizes of pile ends, in place of the mud rings.

So far as other trestle lumber is concerned, it is desirable to preframe and bore that for bulkheads and for guard rails—bulkhead timber especially because of its contact with the ground. Longitudinal girts are of sufficient width and depth to require preframing, while 3-in. by 10-in. or 4-in. by 8-in. bracing lumber is of such size to permit sufficient penetration of the treatment without requiring preframing or boring.

Holes in Tie Plate Area

In addition to the preframing and preboring of bridge and trestle ties before treating, it has been found desirable to prebore vertical holes in these pieces in the vicinity of the running rails to permit drainage of water away from the tie plates, as well as to obtain better penetration of the treatment at the tie plates. This is essential, since in painting or repairing steel bridges, the track spikes are loosened and the ties shifted temporarily during these operations. As a consequence, the areas of bridge ties adjacent to the rails will be disturbed over a period of time, possibly within three to six years, with the result that these parts of the ties will readily decay unless fully penetrated.

Since trestle ties are stocked and planned to be interchangeable with bridge ties for deck girder spans up to 65 or 70 ft. in length, it is desirable that trestle ties likewise be prebored with vertical holes in the vicinity of the rails and tie plates. (See Fig. 1.)

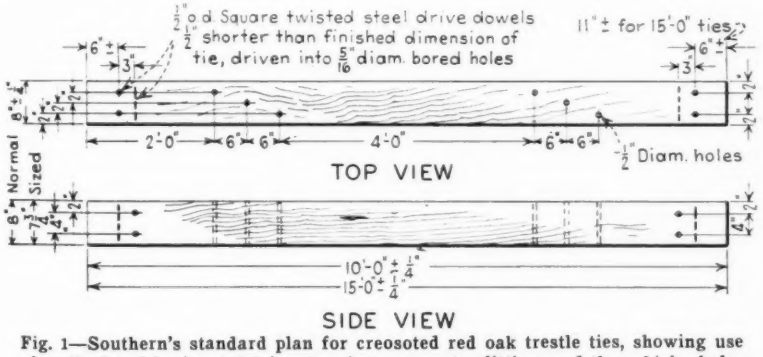


Fig. 1—Southern's standard plan for creosoted red oak trestle ties, showing use of vertical and horizontal drive dowels to prevent splitting, and three ½-in. holes in each tie plate area to insure drainage and thorough treatment in these areas

Originally it was felt that bridge and trestle ties should be prebored for spike holes. When this was done, inaccuracies in locating the holes developed so that the extra work done could not be justified. Furthermore, with different weights of rail at the different bridge and trestle locations, the preboring of spike holes would have required the stock piling of a considerable number of extra ties to take care of the variation in the weight of rail and the consequent spacing of track spikes. The use of three holes at each rail in lieu of four track spike holes at each rail was felt to be a suitable compromise.

Use Drive Dowels

Because of the character of the present-day bridge and trestle lumber, an effort has been made to minimize the checking and splitting of timber, particularly in red oak ties, pine caps and 12-in. by 12-in. fir posts, by the use of ½-in. outside diameter (⅜-in. square twisted) drive dowels, usually ½ in. shorter than the nominal dimension of the lumber parallel to the dowels.

In red oak bridge ties, drive dowels were first located two to each end, placed vertically. The distance from dowel to end was 6 in. and the distance from dowel to edge was 2 in. In addition, anti-checking devices were called for. However, the anti-checking devices proved ineffective and it was decided to try horizontal drive dowels in their place, placing two at each end having an edge distance of 2 to 3 in. and an end distance of 9 in. to clear washer head drive dowels fastening the guard lumber to the ties. (See Fig. 1.) Not enough time has elapsed to prove the efficacy of the horizontal drive dowels in place of the anti-checking devices, but observation indicates that four drive dowels, two vertical and two horizontal, at each end of a red oak bridge tie are far superior to anti-checking devices alone, and superior to the vertical drive dowels and anti-checking devices.

Because of splitting tendencies in large-dimension pine lumber for caps, drive dowels were introduced to obtain longer service life from this material. Horizontal dowels are generally placed in pairs at each end, with an edge distance of 1½

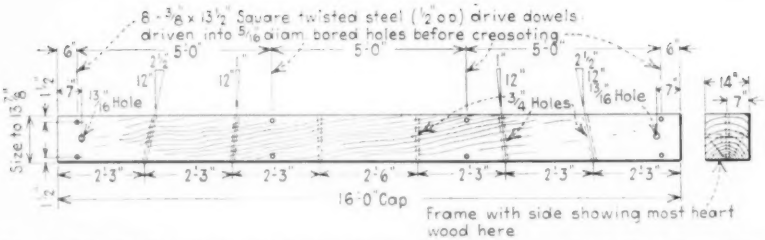


Fig. 2—The Southern's standard plan for creosoted pine caps for ballast deck trestles, showing drilling for drift bolts and use of drive dowels to prevent splitting

in. and an end distance of 6 in. Intermediate drive dowels in pairs are spaced at between 5 and 6-ft. centers, with an edge distance of 1½ in. Field observations seem to indicate that the addition of the drive dowels is worth the extra expense of installation. (See Fig. 2.)

Fir posts of large dimensions split and check considerably and, as a consequence, drive dowels have been used to overcome this action caused by seasoning. Four drive dowels are used at each end in pairs at right angles to each other, with a 6-in. end distance and a 2-in. edge distance. Where the posts are long, it is desirable to use intermediate drive dowels, two pairs each at right angles to each other, spaced approximately 8 to 10 ft. on centers.

Gum Strips on Caps

In addition to the tendency of splitting and checking, pine caps are also subject to crushing, which in turn results in ultimate failure by splitting. It was felt that the application of black or tupelo gum strips, because of the interlocking grain of this kind of lumber, might relieve the crushing, notwithstanding the fact that gum in bearing is no better than pine for strength in compression across grain. This idea developed from the observation that gum crossties do not crush as much under tie plates as do pine crossties.

Since crushing can occur under the stringers at the top of the cap or over the piles at the bottom of the cap, gum strips, 4 in. thick, having the same width as the cap and 10 ft. long, were applied at the bottoms of numerous caps, as well as two gum strips of the same dimensions, but only 4 ft. long, on the tops of these caps, one under each stringer chord. After several years of observation, it was decided to use a single gum strip 11 ft. long on the top of the cap instead of two short pieces each 4 ft. long, and an 11-ft. long gum strip on the bottom of the cap. The gum strips have held up well and relieved the crushing in the caps. (See Fig. 3.)

Cap Failures Reduced

The application of gum strips on the top and bottom sides of caps stemmed directly from the large proportion of creosoted pine caps failing within a four or five-year period after installation. Direct comparison with the same cap material, some installed with gum strips and some without, showed practically no failures with the gum strips applied, and considerable failure of caps not having the gum strips.

The use of gum strips extended from 1939 to 1944, after which, possibly due to a change in specification requirements, the need for the application of gum strips diminished. Failure of the caps crushing during this period indicated that while the surfaces of the caps were well treated with creosote-coal tar solution, checking had resulted from end shakes, thereby permitting water to enter the cracks and cause decay of the entire cap center. Obviously, the interior of these caps contained a great deal of sapwood, which was not well treated.

Use Right Kind of Timber

It is evident that drawing room practices alone, tending toward the preservation of our lumber supply, will not accomplish a great deal unless the right kind of lumber is used for the service intended, the millwork done in preframing and preboring lumber is accurate, and the handling and installation of the lumber by field forces is executed with care, skill and accuracy.

It would appear that specification requirements for lumber should be reviewed jointly by consumers, producers and technical advisers with the view of providing the right kind of lumber for the service intended, thereby avoiding the waste of labor and material which results from having to renew a piece of lumber in a bridge, trestle or track within several years after installation instead of after the full service life has been obtained.

A case in point is the trestle cap —the most important piece of lumber in a trestle and subjected to the greatest punishment. The office can prepare suitable details for insuring long life, the mill can execute the plans perfectly and treat properly, and the field forces can install carefully and skillfully, but if the piece of lumber does not have a requisite number of annual rings and the proper proportion of summerwood, if it has too great a percentage of end shakes which will permit future splitting, this lumber will fail within a relatively short time.

Further Study Required

It will be pointed out that such lumber does not meet the current specifications. Possibly so, but perhaps these specifications need further study and revision to remedy the possibility of early failure. Field examination and study under actual service conditions would do much to throw light on why some lumber, presumably meeting specification requirements, does fail in a relatively short time.

Likewise, if all conditions for treating and installing lumber are only average, but the millwork is sloppy, the lumber, if used, will reduce the life of the lumber adjacent to it. The importance of accurate framing to insure full bearing and proper fit cannot be emphasized too highly.

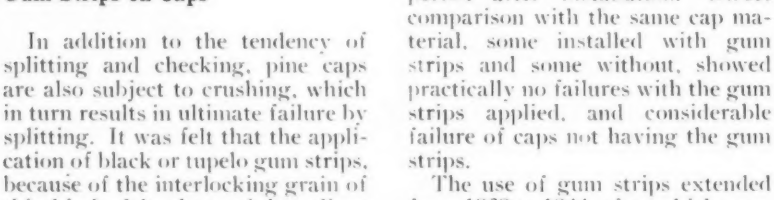
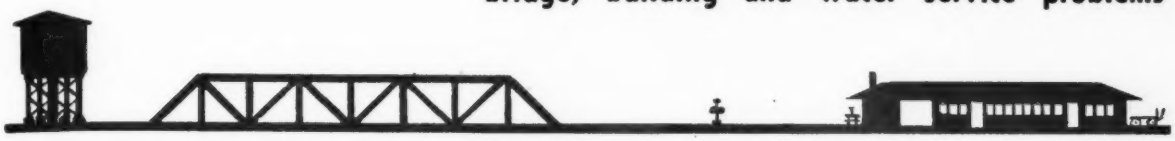


Fig. 3—Southern's plan showing application of gum bearing strips to trestle caps

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Training Men To Operate Machines

What methods should be employed to train men to operate power machines? What problems are involved? Explain.

Experience Is Essential

By W. B. Blix, Jr.
Manager, Railway Equipment Division, Nordberg Manufacturing Company, Milwaukee, Wis.

Too many roads hand a machine to an inexperienced man and say, in effect, "There it is, run it." The first condition imposed on a program for training men to operate roadway machines must be that management must not only want competent operators, but must also provide a proper place for them in their organizational set-up.

The proper operation and maintenance of power machines, as well as the training of operators, should be recognized as a distinct specialty and, therefore, a job for a specialist. Most roadmasters or track supervisors are well informed as to the capabilities and uses of existing power equipment and the techniques which should be employed in fitting such machinery into their programmed maintenance work. However, these men should not be expected to have the technical knowledge of machinery required to train and qualify machine operators or to check such operators in the field use and maintenance of power equipment.

Most roads have many capable equipment operators and maintainers in their maintenance-of-way departments. From these men should be selected those who, by their personality and aptitude, are best equipped to train new personnel. Such a training program, although it might mean raising the salary status of some men, would produce worthwhile savings if costs were carefully investigated. Poorly trained operators produce excessive maintenance costs and definitely increase breakdown time.

The instructor should bear in mind that, although the study of maintenance and operating manuals is esential, there is no substitute for practical experience. Assisting in the repair of machines, in either the field or shop, is most valuable because the lessons thus learned are not quickly forgotten. Preliminary experience as a helper on a machine, followed later by actual handling of the machine under the direction of a qualified operator, is also necessary. Oral examinations on each kind of machine should be conducted by the instructor to qualify an operator on each type. Frequent field checks of an operator's efficiency should follow his actual assignment.

Whether power machine operators are competent or not depends, to a great extent, upon the efficiency of the machinery-handling policy of their respective railroads. In the training of men for machine operator positions there is no substitute for well informed, experienced and adequately trained supervisors of work equipment, who are given authority, as well as responsibility.

Advance Men Progressively

By Jack Largent
Supervisor of Maintenance of Way Equipment, Missouri Pacific Lines, Houston, Tex.

Since knowledge of operating rules is one of the most important factors in training men to operate machines safely, either on or off the track, we have selected the most competent men, already familiar with railroad operation and rules, as operators, and have used younger men for

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the August Issue

1. *To what extent has the use of control-cooled rail affected the need for maintaining records of heat numbers? Explain.*

2. *Why must care be used in disposing of broken or burned-out fluorescent lamp tubes? What method of disposal should be used? Explain.*

3. *If ties in main line track are badly plate cut, yet otherwise sound, is it advisable to turn them upside down in the same location when surfacing track and making general tie renewals? What are the advantages? The disadvantages? Explain.*

4. *How practicable is it to apply metallized zinc, aluminum, lead or other coatings on bridge members or floor systems to minimize corrosion from brine drippings or other causes? How can this be done? Explain.*

5. *What essential features of a trackman's clothing affect his safety when at work? How can men be encouraged to wear safe clothes? Explain.*

6. *What types of toilet facilities are best adapted for use in camp cars or with camp-car outfits? Explain.*

7. *Under what conditions are freighthouse doorways damaged by delivery trucks? How can such damage be minimized? Explain.*

helpers. As other machines have been secured, the older helpers have been advanced to operators.

Having several different classifications and rates of pay, we have been able to observe carefully the qualifications and interest of these men in caring for their respective machines before advancing them to a higher rate of pay and more expensive machines. Men that are unqualified to operate some types of machines are required to familiarize themselves with the operation of these machines. It is very important that an operator understands the operation and maintenance instructions issued by the manufacturer or prescribed by the railroad for the particular machine which he is to operate.

To help men care for machines, we issue certain requirements and instructions in book form. Some men are not mechanically inclined and never make good operators, although they may have a good education and are schooled in this type of work. Machine operators must never quit learning. After having spent years operating many types of machines some men continue to devise new and better ways of doing the work day after day.

Operators of dirt-moving machines, such as draglines, prime movers, carry-alls and bulldozers, should familiarize themselves with the characteristics of drainage areas where they are working, to be able to provide adequate drainage ditches and slopes. Operators using power track wrenches should examine adjustment attachments to get proper tension in track bolts.

To learn how to become a good operator of the type of machine now coming into use on the railroads takes hours of study as well as the cooperation of maintainers and supervisors and an interchange of ideas among machine operators.

Methods of Finishing Bridge Seats

When constructing new bridge seats, is it better to bush-hammer them to final finish after 10 days to 2 weeks, or to elevation-finish them while the concrete is green? Why? Are there other effective methods? Explain.

Movable Bridges Demand Care

By G. G. Thomas
Engineer of Bridges, Atlantic Coast Line, Wilmington, N.C.

Satisfactory bridge seats for fixed-girder and beam spans can be obtained by carefully finishing them to elevation at the time the concrete is poured. The increasing use of cast-steel and of welded-steel pedestals to support such fixed spans permits the shimming of the bearings and the general adjustment of a span with increased tolerances for the elevations of bridge seat finish, provided the area at each bearing is, in itself, accurately level.

Where fixed-truss spans are set on new masonry, it is necessary to secure a very accurate leveling of the bridge bearing to avoid the expense of future jacking and shimming. For such spans careful bush hammering, or chipping, to exact elevation is real economy.

In the case of movable bridges, the elevations of bridge seats obtainable by striking off the freshly poured concrete are not satisfactory. For such structures to seat properly, it is essential that all bearing areas on the concrete should be laid off instrumentally with longitudinal and transverse center lines scribed across and beyond each bearing area. The area of each bearing plate can then be accurately laid out, levels taken, and the hand finishing of each area accomplished to bring all of them to the required level. Repeated instrumental leveling of all the bearing areas and the constant use of the spirit level at each area is required to provide the accuracy necessary in this work.

In setting concrete ballast-deck slab spans, satisfactory seating is obtained by laying a mortar bed on the pier cap just in advance of the actual setting of each slab.

Easier To Finish When Green

By W. A. Swatosh
Assistant Engineer, Erie, Cleveland, Ohio

Last fall, prior to the erection of the steel superstructure by our forces at Bridge H-121.71, Narrowsburg, N.Y., it developed that the contractor constructing the masonry supports was working on such a close schedule that it was doubtful if the north abutment would be ready in time to start to erect the steel on September 27, as planned. The contract specifications provided that the concrete bridge seats were to be bush hammered. To carry out those requirements, the concrete would have had to be cured from one week to 10 days to be hard enough to withstand hammering.

The last concrete was placed in the north abutment on September 23, and to commence erecting steel on the 27th, it was necessary to adopt some other method of finishing the bridge seats. The writer recommended that the bridge seats be cast high, in a manner similar to that normally done for bush hammering, and that the following day they be rubbed down to precise elevation, using a hand or power-driven carborundum stone to grind down such coarse aggregate as might project above the final elevation. The bridge seats were finished in this manner enabling our forces to start erecting bridge steel on the morning of September 27, as scheduled.

The bridge seats of the south abutment, which were cast some time prior to the completion of the north abutment, were bush hammered as provided for in the specification. It took about five days of hand labor to hammer them down to the desired elevation, whereas the grinding method used for treating the north abutment bridge seats required only one day of hand labor.

This experience has focused my attention on the following disadvantages of bush hammering bridge seats: (1) The concrete becomes too hard, requiring, therefore, a longer period to dress it to the correct elevation. (2) After the concrete has been placed, it is not known at what angles coarse aggregates have contact. Therefore, repeated blows, particularly near the corners or edges of the bridge seats, have a tendency to dislodge or shatter the coarse aggregate completely, thereby causing large cavities in the sides, or the shattering of the corners of the masonry, which ultimately has to be patched. Patching after concrete has thoroughly cured is difficult, expensive and generally neither effective nor satisfactory. (3) More man-hours are required to complete the work.

On the other hand, grinding or rubbing bridge seats while the concrete is still green has the following advantages: (1) Green concrete may be rubbed by hand with carborundum or by a powered hand tool containing carborundum. (2) The rubbing method does not dislodge or break the concrete or coarse aggregate, eliminating the need of patching. If patching should be necessary, a better bond is obtained between the green concrete and the

patch. (3) Man-hours are reduced by approximately two-thirds.

Because of its effectiveness, steps have been initiated to specify this method of finishing on other projects. This decision was further helped by the fact that men skilled in the art of bush hammering are vanishing and that some other method such as this will have to be adopted.

Good Housekeeping In Toolhouses

What features are essential to a neat and clean toolhouse? How can interest in such toolhouses be maintained? What are the advantages?

Neat Toolhouses Save Time

By F. W. Biltz
Assistant Chief Engineer, Reading, Philadelphia, Pa.

The essential features of a neat and clean toolhouse are a tool rack for the accommodation of each type of tool and a bin or receptacle for each item of material. Maintaining interest in such a toolhouse calls for alert policing on the part of the supervisor and the encouraging of pride through competition. First among the advantages is the time saved by the gangs when starting out in the morning—effected by each trackman being able to select the required tool from its appointed place rather than from a pile on the floor. Then there is the now-generally-accepted psychological advantage of an orderly operation—that of improving the quality of work performed as well as the production.

In obtaining neatness and cleanliness, rules and instructions go for naught unless racks are provided for all tools, and bins or receptacles for all materials and supplies. In the absence of a system standard for storing tools and materials, the supervisor should prepare a drawing for a series of tool racks which can be constructed for little or nothing out of secondhand 2 by 4's or 3 by 3's, or from scrap boiler tubes or wrought-iron pipe, the latter cut and assembled with the aid of an oxy-acetylene outfit. Provision in the racks should be made for spiking hammers, sledges, claw bars, wrenches, picks, and various types of shovels and adzes.

Racks or platforms for jacks should be set low to the floor, with just sufficient room to permit sweeping underneath them. Saws, level boards, track gages and sight boards should be hung on wall brackets. Special precautions should be taken in the case of sharp-edged tools, such as adzes, axes, scythe blades, etc., to avoid personal injuries.

Although a foreman may prefer to house his motor car in the toolhouse to make it easier to start in the winter, the car can be stored with greater safety in a separate shelter away from the toolhouse.

If no steel shelving is available, satisfactory material bins can easily be constructed of 1-in. or 2-in. boards. A desirable precaution in constructing bins is to leave off the strip, so often placed on the front of each bin at the bottom, which interferes with sweeping or dusting. A clothes closet is also desirable if space is available, to avoid the necessity of hanging excess clothing on the walls or draping them over racks.

The surroundings of a toolhouse can be much improved by eliminating the old open scrap bin and substituting a covered bin or box with a door and lock. This may complicate the loading of scrap, but it eliminates the usually unsightly open bin and lessens the likelihood of pieces of scrap being picked up and placed on the rail by trespassers.

In maintaining interest in neat toolhouses, two types of foremen will have to be dealt with—one characteristically tidy and neat, and the other inclined to the opposite. The latter may require extra effort on the part of the supervisor to convert him, even after the necessary facilities have been provided to keep the toolhouse and surroundings shipshape.

Competitive spirit can be encouraged through the awarding of a certificate for the best toolhouse on the system, chosen by a system committee, from among the prize toolhouses selected on subdivisions and divisions. Signs should be placed on the exterior of these toolhouses indicating, "Best Tool House on System (Subdivision or Division)" for the year in question. These signs should be permitted to remain until the results of the succeeding inspection are determined, thereby serving as an incentive to qualify for the award the following year. It may be necessary to combat the efforts of some over-zealous foreman who keeps one set of tools painted up for display in the toolhouse and another working set in a tool box outside.

As to the advantages accruing, track maintenance is precise work and it is not merely a coincidence when the foreman who maintains a tidy toolhouse has a well-maintained section. The real advantage comes in the saving of time when the gang starts out in the morning. Tools that are in their places are picked up by the men in a much shorter time, and with less confusion, than when the men have to mill around a pile of tools deposited on the floor or in a corner. With an orderly system, considerable time is also saved in the evening when the men return from the day's work.

A more orderly and efficiently arranged toolhouse is just one of the many contributions that maintenance-of-way men can make to assist in overcoming the loss of the sixth day on the track with the advent of the 40-hr. week.

Neatness Aids Efficiency

By Malcolm E. Condon
Track Supervisor, Erie, North Newark, N.J.

Structurally, it is important that a toolhouse be of adequate size so that there is sufficient room for storage bins and tool and material racks, and still have a clear walking space around the motor car. When the toolhouse is large enough, it is possible to construct bins and shelves on one side, material and tool racks on the opposite side, and to leave the rear wall space for the location of lockers or storage cabinets, a bulletin board, and brackets to which can be securely fastened in horizontal position the track gages, level boards, spot boards, clearance rods, etc.

Bins, shelves and racks should be designed carefully and constructed to serve the intended use. Those bins or shelves that are too deep or constructed to heights above the eye level encourage "dead" storage of seldom-used or defective items. Bins for track bolts, spikes and similar items need not be more than 14 in. deep, nor more than 16 in. square, to hold about one and one-half kegs of these particular items. It is well to have an open area beneath the bins, of sufficient height above the floor to permit storage of full, unopened kegs on end, so that the bolts, spikes, etc., required for ordinary maintenance can be kept inside, protected from the weather.

A practical tool rack, consisting of two parallel one-inch pipes with

about a 4-in. space between them, and at an elevation of 4 ft. above the floor, permits the storage of track shovels, ballast forks and rakes, picks, mauls, adzs, and similar short-handled tools. A similar pipe rack at a 6-ft. level will store long-handled shovels and brooms with equal facility. Lining bars, claw bars, track wrenches, rail-anchor wrenches, and other bar tools can either be placed horizontally on metal racks ranged up from the floor level, or stored on end in corner racks. Care should be exercised in the location and construction of the racks for the storage of this group of heavier tools to avoid the possibility of injury in handling them. The placing of all tools and materials in the toolhouse should be considered from a safety viewpoint, and every effort made in the design, location and construction of the bins, shelves and racks to eliminate potential hazards.

The provision of lockers or of one or more wooden cabinets will allow the employees to keep all clothing out of sight and securely locked up. Work clothes, rain coats, rubbers, gloves, etc., when hanging on wall hooks or lying in bins or on shelves detract considerably from the inside appearance of a toolhouse, even though all materials may be stored correctly.

Toolhouses should be painted and repaired when necessary, both inside and out, to maintain a neat appearance. If this is done, the foreman and his men will realize that the railroad is cooperating fully in the maintenance of the structure, and that it is their duty to keep their tools and materials stored neat and orderly at all times. Material stored outside the toolhouse, if any, should be piled neatly, segregated by type, and protected against corrosion. Push cars and any other equipment, such as trailer cars, dump bodies, frog cars, wheelbarrows, etc., for which no covered storage is usually available, should be placed in an orderly manner and properly secured to prevent theft or misuse.

It is important that supervisors impress upon their men the importance of keeping the toolhouse and its contents neat and orderly at all times. Frequent inspections by the supervision, with praise or criticism as conditions warrant, will soon make good housekeeping at the toolhouse a habit. Increased efficiency results through the elimination of lost time in selecting all of the correct, necessary tools and materials required for each day's work when starting from the toolhouse each morning. Correct storage and identification and segregation of the different items permit the taking of frequent inventories rapidly so that depleted items can be requisitioned in time—before the complete exhaustion of stocks.

Inspection of all toolhouses at least once a year by the division engineer, roadmaster, or supervisor of tools and materials, will disclose any conditions requiring correction, and will further impress upon the foremen and their men the importance of maintaining the toolhouse in the best possible condition, with definite advantages accruing to themselves and to the railroad through increased safety and efficiency.

Neat Toolhouses Are Safer

By W. H. Horner

General Roadmaster, Terminal Railroad Association of St. Louis, St. Louis, Mo.

The essentials of a neat and clean toolhouse can be briefly stated as "a place for everything, and everything in its place." Tools and equipment should be piled, racked or hung so that they will be within easy reach, and have no sharp or pointed ends exposed in a manner that will cause an injury.

Interest in well-kept toolhouses can be maintained by impressing upon both the supervisor and foreman that good housekeeping is essential and that they must see to it that tools and equipment are stored correctly when not in use. Furthermore, these men must train their men accordingly.

The chief advantages of orderly toolhouses are that both safety and efficiency will be promoted. When needed picks, claw bars, shovels, etc., are racked separately instead of being heaped indiscriminately on the floor, in a push truck or motor car, gangs get started quicker in the morning. Furthermore, it is much safer handling tools stored in this way. When either air hose or welder's lines are coiled and hung on suitable pegs, deterioration of rubber and fittings is less and handling is easier. Air hoses, particularly, are heavy, and picking them off of the floor could result in strain. It is safer to pull hose from a peg onto a man's shoulder.

Multiflora-Rose Hedge Fences

To what extent can multiflora-rosebush hedges be planted to form right-of-way fences? What are the advantages and disadvantages of such hedges for this purpose. Explain.

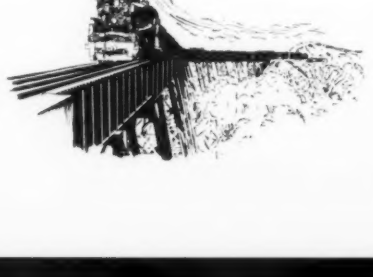
Test Installation Made

By A. W. Schroeder

Chief Engineer, Chicago & Eastern Illinois, Danville, Ill.

Many railroads are faced with the necessity of maintaining many miles of fence. The cost of labor and material makes this an item to consider carefully as it is difficult to determine just what returns are realized by the railroad for such expenditures. Federal, state and county laws and past practices make it imperative that these installations be maintained, both for the protection of the railroad and the adjacent landowners.

The Chicago & Eastern Illinois, taking these factors into account, has worked with the University of Illinois in selecting a shrub that could be planted in some locations to take the place of a fence. The shrub selected was the multiflora rose and a test installation has been made.



Certain things are desirable in a shrub for right-of-way fence. It must have a limited height growth, require minimum attention, and be adaptable to the soil and climatic conditions where it is to be used. The multiflora rose, in our territory, has all of these qualifications.

Certain specifications were required before our test hedge was planted. A minimum of 53½ in. in height, the same height of standard fencing, would have to be maintained. No plantings would be made within 500 ft. of a road crossing to avoid the possibility of obscuring view. Specifications for planting were furnished by university representatives, who suggested that a light plow be used behind a small tractor to plow a continuous furrow. The plants were placed at 12-in. intervals. Two men were used to do the planting, one to set the plants and the other to fill dirt around them. No

water was required during the installation.

A total of one mile of hedge was planted, a half mile on each side of track, near Royal, Ill., on our line from Woodland to Villa Grove. A single row was planted on the east side of the track and a double row on the west side, so that it could be determined which was required to make the barrier stock proof. Another 100 ft. was placed on the west side of the track near Grant Park, Ill., on our line from Chicago to Evansville. A total of only $36 was spent, including the rental on the tractor, but not including the purchase of the plants. It is estimated that within three months we will be able to determine the percentage of loss of the planting and within two years the effectiveness of multiflora roses as a barrier.

Makes Stock-Tight Fence

By R. H. Musser
Regional Conservator, U.S. Department of Agriculture, Soil Conservation Service, Milwaukee, Wis.

Multiflora rose is being used successfully for permanent farm fences. It provides a permanent, non-spreading, living fence for separating fields, and for protecting odd areas from grazing livestock, on a rapidly increasing number of farms in areas where it is adapted. It has many important advantages, including low maintenance cost and the fine habitat that it provides for many beneficial kinds of wildlife. It is a thing of beauty throughout the year. In the spring it is a mass of white bloom, in summer a very attractive green hedge, and in the fall and early winter a heavy crop of red berries gives it an attractive appearance. Planted a foot apart, it provides a tight livestock fence and does not spread from sprouts, as does osage orange. Birds may spread the seed but this has not been a problem because multiflora rose is not hard to kill if it does become misplaced.

Railroads might well consider this shrub for right-of-way fences. The advantage would be permanence, with practically no maintenance cost, once the fence is established. The disadvantages would include snow drifting and danger of damage from fire. We have no definite information on its fire resistance.

Multiflora rose is early spring planted in a well-prepared site. Site preparation usually consists of plowing three or four furrows, preferably in the fall. The plants should be cultivated the first year. Mulching is often used in place of cultivation, but the fire hazard may rule it out on railroad rights-of-way. Probably small power equipment, such as garden tractors, could be used to cultivate the planting.

Multiflora rose is adapted to a fairly wide range of soil conditions. However, good drainage is required. The young plants will respond to an application of 2 to 3 lb. of nitrogen fertilizer per 100 lin. ft. This treatment will increase growth and tend to reduce losses the first year. Our field observations indicate that the plant can be recommended for use as far north as U.S. Highway 30.

After-Precipitation and Its Control

What are the disadvantages of after-precipitation from treated water? How can it be controlled? Explain.

Result of Super-Saturation

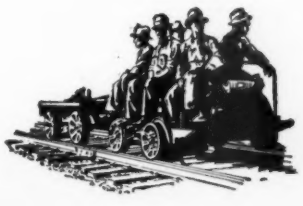
By Walter Leaf
Research Technician, Denver & Rio Grande Western, Denver, Colo.

After-precipitation from treated water is merely the continued precipitation of calcium carbonate and magnesium hydroxide from a super-saturated solution—the treated water—after this water has left the site where the reaction was supposed to take place.

The rate of chemical reaction is controlled by the type of reaction, that is, whether two, three or four ions are involved in the unit process, the temperature of the solution, and the concentration of the reacting chemicals. Precipitation from a super-saturated solution is accelerated by the presence of numerous nuclei, or crystals of the solid phase, and is delayed by their absence.

The above paragraph indicates the possible methods of completing the softening reaction within the intended confines, so that after-precipitation is eliminated. And incidentally, after-precipitation leads to scaled water lines all the way from the softener to the boiler check on the locomotive.

Different water supplies contain variable amounts of scale-forming materials — chiefly calcium, magnesium and silicon compounds. The chemicals used for water softening are calcium hydroxide and sodium carbonate. Usually the lime and soda ash are mixed together in solution and suspension in a single tank. There is here a slight reaction to form sodium hydroxide and calcium carbonate.



When this suspension is added to the water to be treated, various chemical reactions take place. Calcium in solution is precipitated as the carbonate, and magnesium should be precipitated as the hydroxide. However, a soluble, complex, basic magnesium carbonate may be formed, which is difficult to break down to the hydroxide. If, however, the lime suspension is added to the water first, the magnesium may be rapidly and completely precipitated. Thereafter, the soda ash may be added, and softening reactions completed. This type of treatment gives very good results, a rapidly-settling floc and fairly complete treatment. However, it requires additional equipment. The chemical reactions may be pushed farther toward completion by adding large excesses of lime and soda ash. This is expensive and yields water which may cause foaming in the boiler.

Another way of preventing after-precipitation is to increase the size of the reaction tank. This method is expensive in that as much as 24-hr. retention may be necessary for cold water. Still another method is to increase the temperature of the water. This is only economical at stationary power plants where exhaust steam is available and a large portion of the heat may be retained in the water until used.

In recent years a much more economical method of preventing after-precipitation has come into use. Coagulants such as aluminum or ferric hydroxide formed in the water have the specific power of absorbing certain ions and bringing them closer together so that reaction can take place. The action is something like throwing a rope ring around dancers on a floor, and pulling the ring tight. More collisions between dancers will result when the ring is small than when large. With a coagulant, the

precipitated matter is in larger particles, which settle out faster.

A more-recent development—the accelerator—uses the device of increasing the concentration of nuclei in the water so that the super-saturated solution reaches equilibrium faster.

A pipe line badly scaled by after-precipitation may be slowly cleaned out by running Zeolite or ion-exchange treated water through it. Also, in some cases, the use of aluminum hydroxide coagulant will slowly clean out the old deposit. The action in the latter case seems to be one of hydrolysis of the silica which acts as a binder for the deposit. Either of these methods requires months or years to accomplish results.

Water may be stabilized against after-precipitation by dissolving a sufficient amount of carbon dioxide gas therein. This device is used particularly in municipal plants, where only partial softening is desired. Such treatment improves the taste of the water.

The above discussion gives the bare outlines of the after-precipitation problem. Greater detail would require more space than is available. The science of boiler water treatment is not particularly involved, but it has a lot of little components, each of which has a considerable number of angles.

Control Varies With Cause

By H. L. McMullin
Engineer Water Supply, Texas & Pacific, Dallas, Tex.

The disadvantages of after-precipitation from treated water depend upon the form in which the precipitation occurs, and the method of control of after-precipitation depends upon which of various causes are responsible for its formation. In the form of "milky water," its principal disadvantage is in its strong tendency to cause foaming in boilers. In aggravated cases of this form it may also cause pipe line stoppages.

As to encrustation, the principal disadvantages of after-precipitation are first, partial stoppage, eventually complete stoppage of pipe lines, and the interference with the operation of valves, pumps and injectors. It also collects on filter sand and other filter media, gradually reducing filter efficiency and finally eliminating filtering action. Probably the most prevalent and most annoying manifestation of after-precipitation is that of encrustation in injectors, branch pipes, boiler checks and feed lines in stationary boilers. This is particularly true in cases of externally-treated water.

In the control of after-precipitation, first consideration should be given to efficient operation of water treating plants. Even the most efficient operation of plants of the best design will not, however, entirely eliminate after-precipitation, but such will reduce it by holding the potential precipitation to the minimum. Coagulants such as sodium aluminate and iron sulfate will frequently be found helpful in attaining efficient plant operation.

It is often found necessary or desirable to supplement efficient plant operation with other means of control of after-precipitation. Various organic and inorganic surface-active agents eliminate or reduce after-precipitation when correctly used. Molecularly dehydrated phosphates, such as sodium hexameta-phosphate, in quantities of 1 to 5 p.p.m. have been found very effective in preventing the formation of encrustation. However, this material begins to revert to normal phosphate at temperatures around 160 deg. F.—its effectiveness diminishing as the temperature rises above that point. Tannin, extracted from hemlock, quebracho, Philippine cutch and others, in quantities of 5 to 8 p.p.m., have also been found very effective for this purpose and is effective at somewhat higher temperatures. Encrustation from after-precipitation may also be prevented by recarbonation with carbon dioxide gas, or by using sodium bicarbonate as a part or all of the soda-ash treatment. The selection of the method or chemical to control after-precipitation will depend upon the conditions existing in the particular case under consideration.

Employing Outside Architects

To what extent should a railroad employ outside architects or architectural firms to design or redesign passenger stations, shops or other large facilities? What are the advantages? The disadvantages, if any? Explain.

Consultants Often Desirable

By Chief Engineer

I think it will be found that a rather large proportion of the work classified on any railroad as building work is of a kind which does not require architectural treatment in the technical sense. The usual problems simply involve sound knowledge of building design and construction and are well within the scope of any good railroad building organization. On the smaller part of the work that does require technical treatment, this treatment can be afforded by the architects in such an organization, in their stride.

Upon occasion, there will be large building projects beyond the scope of the railroad's normal organization with respect to the amount of work involved. A monumental passenger station or a big office building would likely fall in this category. Other large projects of a highly specialized character will also be encountered infrequently, and require the use of experts in the particular field. In both cases, outside help seems to be the proper answer and can best be provided by a consulting architect, engineer or a consulting firm.

Some railroads have found it much to their advantage to retain an outside architect or architectural firm on an agreed consulting basis. This arrangement has certain advantages in that, if the consultant has been carefully chosen, there is always available expert service on problems involving architectural treatment, and expert advice on architectural trends, building materials and building methods. Furthermore, the consultant's organization is available on short notice to relieve peak loads and permit the railroad to carry on with a normal and stable organization of its own.

There does not seem to be any particular disadvantages in using outside consultants so long as effective liaison is maintained by the railroad building organization between the consultant and the several departments of the railroad involved and interested in a given project.

More Architects Needed

By Judd Payne
Publishing Director, Architectural Record, New York

With true respect for the competence of the railway engineering staffs that are charged with the design and maintenance of structures, benefits will invariably accrue if a competent architect is retained as a consultant. This goes for design of

shops, freight terminals and miscellaneous service-building facilities in general, but applies particularly in the case of passenger station and terminal facilities.

The competent engineer's approach to building design would ordinarily yield a structure that is sound. Provision for the shelter of the *things* which the building is intended to shelter will be adequate. Where the architect would make his contribution would be in analyzing the problem from the standpoint of *people*—people who will work in the building, pass through the building, transact business in the building, or just plain catch a fleeting glimpse of the building as they speed by.

Work in the design of airport facilities has demonstrated conclusively that the real problem is not to design for the coming and going of planes and the storage and service thereof primarily, but to design for the people who fly and for those with an interest in flying. The restaurants, shops, toilet facilities, hotel accommodations, and parking accommodations that are being designed into modern airports by architects represent a peculiar contribution that they are able to make because of their training in analyzing building design in terms of people's use, their reactions in using, and their reactions in seeing.

Moreover, the architect's potential contribution—particularly to buildings used largely by people, i.e., stations and terminals—can have much to do with the improvement of public relations and with a decrease in the absolute cost of maintaining these facilities.

I don't say that some engineers can't make the kind of an approach I am talking about. But I do say that the engineer is unbeatable when teamed with an architect who approaches the problem from the standpoint of people using the structure, and of procuring maximum return on the investment in the structure and minimum maintenance thereof.

John Root's station at Eau Claire, Wis., is the sort of thing I am talking about. His station at Burlington, Iowa, is another. The relatively new terminal at Los Angeles is still another.

I recognize, of course, that a fundamental problem of many railroads is that of financing new stations and terminals found desirable. Here again, I am persuaded that consulting architects frequently would make a larger contribution, particularly if such architects were familiar with the communities to be served. An architect retained to work with a road's engineers, in order to ascertain whether or not a certain type of new station could be nearly self-supporting without respect to direct passenger traffic, would frequently yield very sound recommendations.

Bear in mind that it is only the outside architect with a range of experience in meeting the needs of the people for many types of facilities who is likely to attack the station or terminal problem with a background broad enough to make a maximum contribution at minimum net cost to the carrier.

As an individual who uses a few hundred railroad stations almost every year, and as one responsive to the kind of facilities that architects are being invited to design to a greater extent for people bussing and flying, I would like to see more architects at work on the very practical problems of taking better care of people railroading.

Modernizing Old High Stations

What is the most effective and economical way to lower the roof lines and ceilings of old frame passenger stations to give them a modern appearance? Explain.

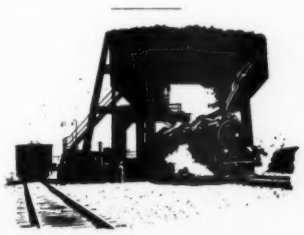
Remove Second Story

By T. J. Engle
Engineer of Buildings, Chicago Rock Island & Pacific, Chicago

We have found that the most effective and economical way to lower the roof lines and ceilings of old frame passenger stations is to remove the second story down to the floor joists. These can then be retained for use as first-floor ceiling joists onto which a new roof can be framed. In structures in which the second story does not extend the entire length of the building, the new roof should conform with the pitch and style of the roof on the existing single-story section.

In depots at which it is desirable to reduce the ceiling height of the first story, the studs should be cut off as required and the top plate and ceiling joist lowered accordingly. In some instances the second-story roof framing lumber will be good enough to be reused in the framing of the new roof. Asbestos or asphalt shingles of appropriate color applied to the new roof, and the adjustment of the chimney height complete the lowering of the roof lines.

Generally the appearance of the old building can be further improved by replacing the windows and doors with a type of more modern design, adjusting the line of the eaves, and possibly by adding a canopy. Deteriorated siding may be covered with asbestos siding shingles laid over 45-lb. roofing felt, or with a brick veneer from the foundation up to the line of the window sills, plus a stucco veneer above this point.



Cut Off At Bottom

By J. W. Hayes
Architect, Great Northern, St. Paul, Minn.

The most effective and economical way to lower the roof lines and ceilings of an old frame passenger station to give it a modern appearance is to first jack up and block the old frame structure, and then to cut off the studs at the bottom to provide a ceiling, 10 ft. high, which is the height required in some states. This is also the best way to remove any decayed lumber around the base of a structure if such exists. Cutting off the studs all around the building to 9 ft. 6 in. will provide the 10-ft. ceiling height if the building is placed on a new reinforced concrete foundation and floor with a 6-in. concrete base. Eaves and rake should also be cut off to conform with modern practice.

Reducing the height of the entire building will require less siding and interior finish; consequently, less painting is necessary. New low horizontal-type windows can be installed at the right elevation, instead of high windows. The ceiling, having been reduced in height by cutting off the studding at the bottom, should then be covered with a ½-in. tile board, the size of which could be 16 in. by 16 in., or any other standard. This method of reducing the height of the building, as well as the ceiling, certainly improves old stations architecturally.

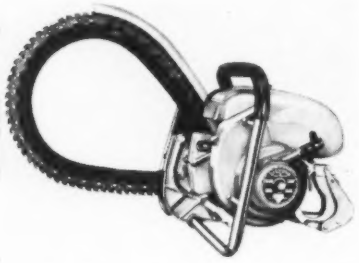
PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices

(For additional information on any of the products described in these columns, use postcards, page 609)

DISSTON BOW SAW

HENRY DISSTON & Sons, Inc., Philadelphia, Pa., has added to its line of power chain saws, a one-man bow saw which is said to eliminate pinching in the cut, thereby elimi-



The Disston one-man bow saw

nating the necessity of frequent starts and stops when sawing.

On the bow saw a straddle-type chain travels on an open circular guide rail. Its sawing capacity is 15 in. The saw is powered by a 3½-hp. Mercury gasoline engine which delivers maximum power at an engine speed of 4,000 r.p.m. This engine is the same as that used on the Disston one-man chain saw, and the bow saw and the conventional 18-in., 24-in. and 30-in. flat guide rails are therefore interchangeable.

The features of the bow saw include full precision-bearing construction; a specially-designed fuel meter which provides positive flow of the correct fuel mixture at all times and in any position, and which also acts as a governor to control engine speed; a fully-protected crank-shaft-type magneto; a self-rewinding Magnapull Starter; automatic positive chain lubrication; a pistol-grip handle on which all controls are located; and a clutch which is disengaged by a squeeze on the handle and quickly re-engaged by releasing a single safety catch.

HYDRAULIC-POWERED TRACTOR MOWER

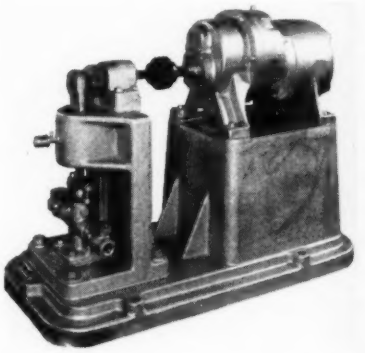
THE Oliver Corporation, Industrial Division, Cleveland, Ohio, is introducing, for right-of-way mowing, a hydraulically-operated cutter bar, called the Davco Hydro-Mower. Although the mower is designed particularly for mounting on Oliver 60 and 70 wheel-type tractors, it can be operated from any adequate source of hydraulic power and in conjunction with other hydraulic attachments, such as loaders, bulldozers and snow plows.

The mowing angle of the unit ranges from 55 deg. below horizontal to 95 deg. above. The hydraulic-power feature is said practically to eliminate vibration and thereby reduce equipment wear and operator fatigue. The operation of the cutter bar and heel of the mower is finger-tip controlled and independent of the speed of the tractor or operation of the clutch. The unit can be quickly attached or removed. The mower is available with either a 5-ft. or a 6-ft. cutter bar.

A Davco Hydro-Mower mounted on an Oliver 60 industrial tractor

DEARBORN IMPROVES ITS CHEMICAL PUMPS

AN improved design of the Type "SR" and "ER" chemical pumps for feed-water treatment, incorporating new heavy-duty motorized reduction gears, has been announced by the Dearborn Chemical Company, Chicago. It is said that greater power and efficiency, quieter operation and reduced maintenance have been obtained in the new design.



New heavy-duty motorized reduction gears have been incorporated in the Dearborn chemical pumps for feed-water treatment

Other features of the new pumps include an improved base casting which provides additional support, and a pump packing in which the lantern ring has been eliminated and spring loading of the Chevron type substituted therefor. The new packing arrangement is said to eliminate the possibility of damage from excessive tightening.

LE ROI TIE TAMPER

THE Le Roi Company, Milwaukee, Wis., has announced a new Model 10 Tie Tamper, a pneumatically-operated unit which, while weighing only 31½ lb., is said to have the power and stamina of much heavier tools. Eight of these tools can be operated by the Le Roi 105 Tractair or any other air compressor with a capacity of 105 c.f.m.

The Le Roi Model 10 Tie Tamper

The outstanding features of the tool include a built-in lubrication system with a capacity sufficient for full-shift operation, a readily replaceable throttle valve that keeps the throttle free and air tight, forged-steel parts where extra strength is needed, and a one-piece steel-and-bonded-rubber buffer which provides an effective dirt seal, and which facilitates the changing of tamping bars.

NEW APPLICATION OF PENTACHLOROPHENOL

A NEW application of pentachlorophenol-in-oil solutions, namely, protecting freshly-adzed tie surfaces, has been announced by the Dow Chemical Company, Midland, Mich. Such a solution, a recognized wood preservative, has a low viscosity; consequently it can be applied in cold weather, either by spraying machines or by brush, without heating. In warm weather its low viscosity facilitates rapid penetration into the surface on which it is applied.

The commonly used solution—five per cent pentachlorophenol in petroleum oil—is said not to be corrosive to the metals used in the construction of spraying machines, and, to date, no such trouble has been reported. Pentachlorophenol is available in dry crystals, to be blended with petroleum oil as a concentrate and later diluted with oil, or in ready-to-use solutions in drums or tank cars.

SUMP PUMP BY FAIRBANKS, MORSE

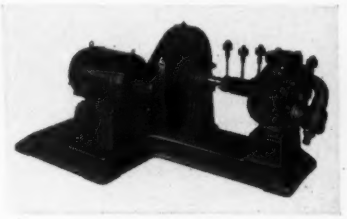
FAIRBANKS, Morse & Co., Chicago, has announced an economical sump pump, designated as Model 49A, which is so designed that it can be used in 12-in. drain tile. It has a capacity of 4,200 gal. per hr. at a discharge head of 5 ft. The principal features of the pump include new-type vulcanized rubber positive-control floats, continuous-duty motor, stainless-steel shafts, and a bronze impeller of open construction.

The Model 49A

TOTALLY ENCLOSED FUEL OIL PUMP

THE Viking Pump Company, Cedar Falls, Iowa, is introducing a new pump, called the Viking Model Q162, for fast handling of gasoline or Diesel fuel oil. The pump, along with its gearing and motor is totally enclosed, a feature which permits outdoor operation without protection.

Other features of the unit include an oil-tight cast-iron gear case with bullseye sight gage, filler and drain plug; a combination flange-and-foot type radial bearing mounted on a pedestal for supporting gear case and pump shaft; a stainless-steel pump shaft; a Viking valve on the pump head for prevention of damage when discharge line is closed (optional feature); an extra long stuffing box on pump, with bronze studs and nuts; five extra-large ball check grease cups on pump and bearing (other style grease fittings optional); and a rugged, streamlined base, motor rails and single gearing.



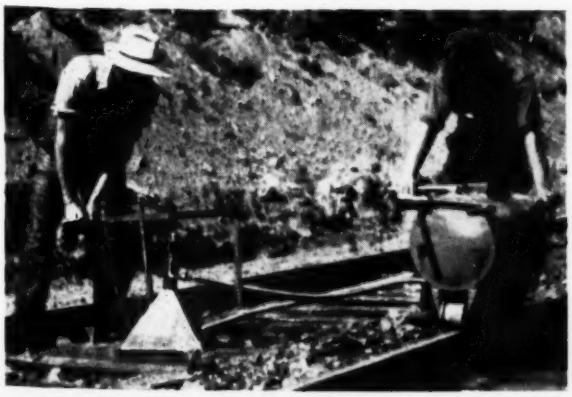
The Viking Model Q162 fuel oil pump is a totally enclosed unit to permit its operation outdoors without protection

COPPERIZED CZC FOR WOOD PRESERVATION

A NEW wood preservative, known as Copperized Chromated Zinc Chloride, has been developed as a result of a cooperative research program carried out by Koppers Company, Inc., Pittsburgh, Pa., and E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. In the course of the research program many formulations were considered and evaluated, but the best and most economical results were obtained with a composition containing 73 per cent zinc chloride, 20 per cent sodium dichromate and 7 per cent cupric chloride. It is reported that this new formulation has shown excellent wood-preserving qualities, superior, in fact, to those of Chromated Zinc Chloride.

The following give a brief account of the various tests that were conducted to evaluate the new preservative, and of the results obtained.

Leach Block Tests—These indicate that Copperized CZC will resist leaching better than CZC. Furthermore, it appears that the addition of cupric chloride does not chemically alter the CZC; the latter retains its usual preservative, fire-retardant and leach-resistant qualities and is improved by the high toxicity and leach resistance of cupric chloride.



Pentacholorophenol-in-oil can be applied to freshly-adzed tie surfaces by spraying machines, such as the unit shown here

For additional information on any of the products described on these pages, use postcards, page 609.

Hardware Corrosion Tests—Results of two years of exposure show that corrosion of hardware in contact with wood treated with either CZC or Copperized CZC is very slight and is essentially of the same magnitude in either case.

Accelerated Service Tests—In these tests the effect of adding various amounts of cupric cholride to CZC was investigated. In all cases it was found that the addition improved the preservative value of the compound, but the proportion which gave the best results was seven per cent, as mentioned previously.

Pilot Plant Treatments—These were undertaken to evaluate the behaviour of Copperized CZC under plant-operation conditions with respect to such factors as equilibrium ion concentration, change of pH and ease of handling. The preservative proved in these treatments to be similar, in handling, treating and control of the solution equilibrium, to CZC and other salt preservatives containing more than one type of toxic ion.

Strength Tests—Results of these tests indicate that treatment of wood with Copperized CZC is not detrimental to static-bending, compression, shear and hardness values of wood.

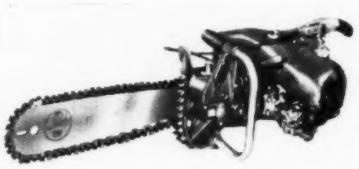
Glow Tests—Since some copper-bearing salt preservatives are known to impart severe glowing characteristics to wood, these tests were conducted to determine if Copperized CZC had this adverse effect. The results indicate that such is not the case; glowing in wood treated with Copperized CZC is similar to that treated with CZC.

HARTOP ELECTRODES

A NEW line of four hardfacing welding electrodes has been announced by the Harnischfeger Corporation, Milwaukee, Wis. One of these electrodes, called "Hartop Red," forms a tough deposit designed to resist severe impact and extreme abrasion. Another, "Hartop Yellow," produces a deposit which resists abrasion and deformation caused by weight and impact. The third, "Hartop Green," is a general all-purpose hardfacing electrode. The fourth electrode, "Hartop Brown," is designed for application to parts subject to abrasion and angular shock. It is said that, using these electrodes, good results are obtained without employing any special technique in their application.

HORNET LINE OF POWER CHAIN SAWS

THE Southern Distributing Company, Cincinnati, Ohio (the American representative of Hornet Industries Limited, Guelph, Ont.), is introducing two new models of Hornet chain saws. One of these is the Model DJ, a one-man saw weighing approximately 32 lb. It is available with open-end blades in the following sizes: 16 in., 20 in., 24 in., 30 in. and 36 in.; and with tailstock blades in 24-in., 30-in. and 36-in. sizes.



One of the new Hornet chain saws

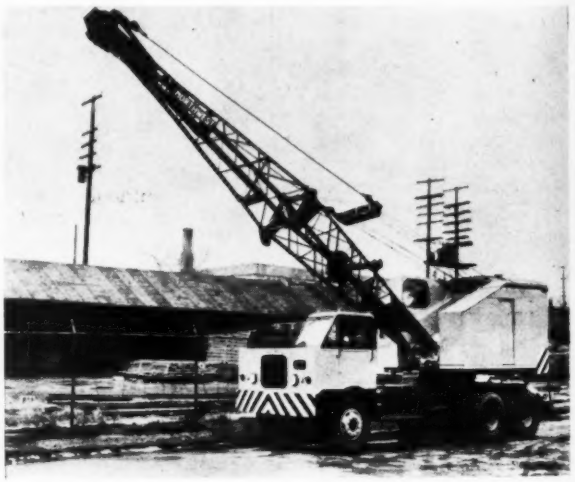
The other new unit is the Model D, which weighs about 60 lb. and which can be handled easily by two men without undue fatigue. It is available in 24-in., 30-in., 36-in., 48-in., 60-in. and 72-in. blade sizes. In both units the blade swivels through 180 deg. and can be locked in any desired position or angle.

The features of the Hornet line of chain saws include rugged construction, quick starting, dependable operation, easy handling and simplicity of service. Points requiring service, such as the carburetor, magneto, chain oiler and clutch, are mounted in the open where inspection and repair can be made quickly and easily. The chain can be sharpened in the field by a hand file.

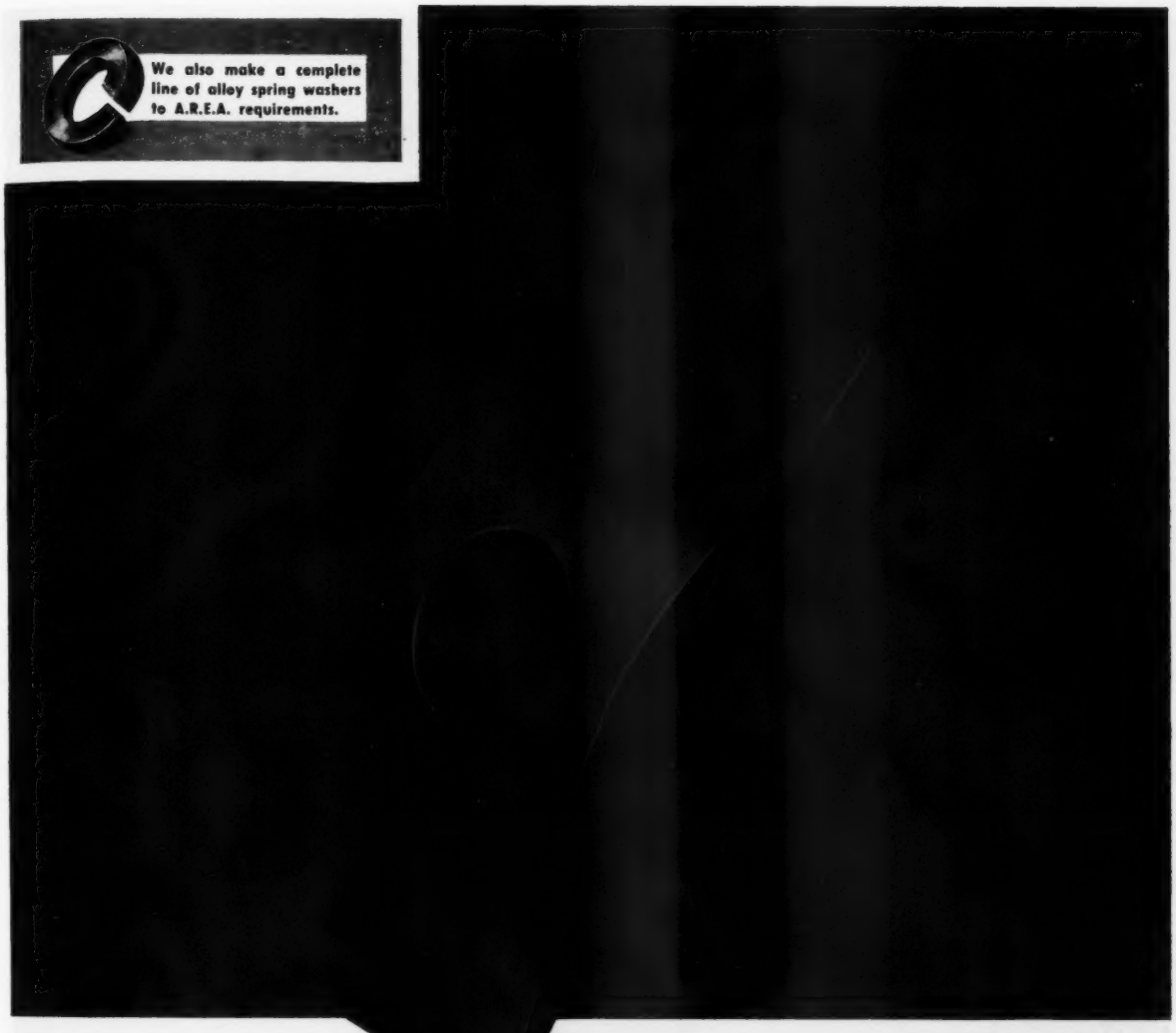
TRUCK CRANE AND CARRIER COMBINATION

THE Northwest Engineering Company, Chicago, has announced a new truck crane and carrier combination with a boom that can be extended from 30 ft. to 100 ft. by the addition of standard intermediate sections. The main operating machinery of the crane is mounted on cast-steel side frames. All high-speed shafts are mounted on either ball or roller bearings. Standard equipment includes a "feather-touch" clutch control which utilizes the power of the engine to throw heavy drum clutches; uniform-pressure swing clutches; and a high-speed, power-controlled boom hoist.

The carrier has a box-type truck frame which is reinforced throughout its full length. The method of attaching the crane base to the carrier permits the transmission of loads evenly over its top and sides. The carrier is equipped with outriggers which extend for its full width. The forward outrigger is located close to the rear wheels to relieve the carrier of excessive stress. The rear outrigger trunk is demountable and makes possible changing from crane work to shovel, dragline or hoe work without the necessity of repositioning the lower base of the crane.



The Northwest truck crane and carrier combination



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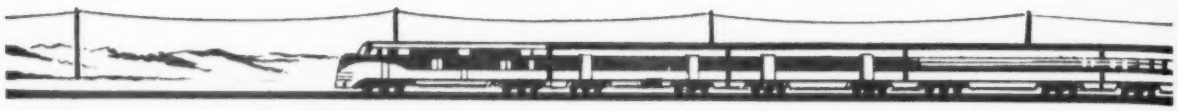
THE MONTH'S NEWS

Happenings among the railways—the associations—the suppliers



Changes in Railway Personnel

General

C. F. Trowbridge, assistant chief engineer of the Pennsylvania, has been promoted to assistant to the vice-president in charge of operation, with headquarters as before at Philadelphia, Pa.

R. S. Stewart, division engineer of the Pennsylvania—Reading Seashore Lines, with headquarters at Camden, N.J., has been promoted to assistant to the general manager, with the same headquarters.

David E. Smucker, general manager of the Long Island, and an engineer by training and experience, has been appointed trustee and chief operating officer, with headquarters as before at Jamaica, N.Y.

W. J. Turner, assistant chief engineer of the Atlantic Coast Line, with headquarters at Wilmington, N.C., has been promoted to superintendent transportation of the Southern district, with headquarters at Jacksonville, Fla.

R. G. May, superintendent of the Hudson and Mohawk division of the New York Central, with headquarters at Albany, N.Y., and an engineer by training and experience, has been appointed general manager of the Boston & Albany, with headquarters at Boston, Mass.

James P. Walker, general superintendent of the Southern division of the Atlantic Coast Line at Jacksonville, Fla., and a former division engineer, has retired from active service at his own request, after more than 43 years of service with that road.

Frederick B. Hank, assistant to the general manager of the New York Central Lines, East, and an engineer by training and experience, has been appointed to the new position of general manager of the Electric, Harlem, Putnam and River (West Shore) divisions and the New York Terminal district, including the Marine department, with headquarters as before at New York.

W. O. Tracy, Jr., roadmaster on the Norfolk & Western, with headquarters at Iaeger, W. Va., has been promoted to assistant superintendent of the Radford division, at Roanoke, Va., succeeding the late **J. R. Altizer,** whose death is reported elsewhere in these columns. Mr. Tracy entered the service of the N. & W. while a student at the University of Kentucky, being employed during summer vacations beginning in 1936. His permanent service with the road began in June, 1939, following which he served in several capacities on the Pocahontas division until January, 1942, when he was advanced to assistant roadmaster on the Radford division at Pulaski, Va. After three years of service in the Army, Mr. Tracy returned to the N. & W., in December, 1945, as assistant roadmaster on the Scioto division, at Portsmouth, Ohio. He was promoted to roadmaster at Iaeger in August, 1946, and held that position until his recent promotion.

Engineering

L. W. Funk, engineer maintenance of way of the Charleston & Western Carolina (a subsidiary of the Atlantic Coast Line), with headquarters at Augusta, Ga., has been appointed assistant chief engineer of the A.C.L., with headquarters at Wilmington, N.C., succeeding **W. J. Turner,** whose promotion to superintendent transportation is noted elsewhere in these columns. **C. E. Vick,** roadmaster on the A.C.L. at Albany, Ga., becomes engineer maintenance of way of the C. & W. C., replacing Mr. Funk, and **J. R. Chasten, Jr.,** senior assistant engineer at Jacksonville, Fla., has been promoted to division engineer at that point, succeeding **W. E. Free,** who has been appointed roadmaster, as noted elsewhere. Mr. Funk was born at Charleston, S.C., and was graduated from Alabama Polytechnic Institute, Auburn, Ala., in civil engineering. Mr. Funk entered Coast Line service on April 1, 1919, as rodman at Palmdale, Fla., and served successively as inspector, instrumentman, draftsman, junior engineer and assistant engineer. He joined the Charleston & Western Carolina (A.C.L. affiliate) in 1926 as assistant engineer at Augusta, Ga., and was appointed engineer maintenance of way on October 1, 1940, which position he was holding at the time of his recent appointment as assistant chief engineer.

L. W. Funk

Gerald W. Becker has been appointed special engineer (drainage and flood control) on the Chicago, Rock Island & Pacific, with headquarters at Chicago, succeeding **C. U. Kitzmiller,** transferred.

C. S. Wilson, chemist for the Southern Pacific Lines in Texas & Louisiana, has been appointed engineer of tests, with headquarters at Houston, Tex. His former position has been discontinued.

Charles Weiss, supervisor of track on the Fort Wayne division of the Pennsylvania, with headquarters at Valparaiso, Ind., has been promoted to assistant engineer in the office of the chief engineer maintenance of way of the Western region, Chicago, where he succeeds to the duties of **E. D. Flad,** assistant to the chief engineer maintenance of way, who retired on May 1.

John E. Hoving, principal assistant engineer of the Northern Pacific at St. Paul, Minn., has been appointed district engineer at that point, succeeding **Henry F. Brown,** who has retired after 43 years of service. Mr. Hoving has been succeeded by **D. H. Shoemaker,** office engineer at St. Paul. **W. R. Bjorklund,** assistant district engineer at Billings, Mont., has been appointed to replace Mr. Shoemaker.

T. W. Pinard and **J. M. Nicholson** have been appointed chief engineer and assistant chief engineer, respectively, of the Long Island, following the establishment of a trusteeship for that road. Mr. Pinard was formerly engineer of bridges and buildings of the New York zone of the Pennsylvania, now abolished, which included the Long Island and the Pennsylvania New York division. Mr. Nicholson was assistant to the chief engineer of the New York zone.

(Please turn to page 600)

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Write for Bulletin 1943
Maintenance-of-Way Equipment

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Railway Personnel (Cont'd)

N. M. Kelly, division engineer of the Montreal Terminals division of the Canadian Pacific, at Montreal, Que., has been appointed assistant engineer in the office of the vice-president and general manager, at Toronto, Ont.

J. C. Warren, assistant division engineer of the Middle division of the Pennsylvania, with headquarters at Altoona, Pa., has been promoted to division engineer of the Atlantic division, with headquarters at Camden, N.J., succeeding **R. S. Stewart,** whose promotion to assistant to the general manager is noted elsewhere in these columns. Mr. Warren will also serve as division engineer of the Pennsylvania—Reading Seashore Lines. **P. S. Settle,** supervisor of track on the Maryland division, with headquarters at Perryville, Md., has been promoted to assistant division engineer of the Middle division, succeeding Mr. Warren. **W. R. Taggart,** assistant engineer in the office of the chief engineer, maintenance of way of the New York zone, has been transferred to the office of the chief engineer—system.

Andrew F. Huber, whose promotion to assistant division engineer of the Ohio division of the Baltimore & Ohio, with headquarters at Cincinnati, Ohio, was announced in the April issue, was born at Cincinnati on April 11, 1918. He is a civil engineering graduate of the University of Cincinnati and entered the service of the B. & O. on May 26, 1941, as assistant in the engineering corps, being assigned to the office of the engineer maintenance of way, at Cincinnati. He was transferred in this capacity to Pittsburgh, Pa., on October 1, 1942, and was appointed maintenance inspector in the office of the chief engineer maintenance of way, at Baltimore, Md., on July 1, 1944. Returning to Cincinnati in 1946, Mr. Huber later assumed charge of the engineering corps at that point and held this position until his recent promotion.

The jurisdiction of the maintenance of way department of the Jersey Central Lines has been transferred from the chief operating officer to the engineering department, effective May 1. **Thomas E. MacMannis,** engineer maintenance of way, will continue in that capacity, with jurisdiction over maintenance of track and right of way. **Carl H. Vogt,** division engineer, has been appointed assistant engineer maintenance of way. **Bernard J. Minetti,** bridge engineer, has been appointed engineer structures, in charge of design and maintenance of bridges and buildings. **John R. Prizer,** division engineer, has been appointed engineer maintenance of structures. **Edward J. Robrecht,** assistant division engineer, has been appointed assistant engineer maintenance of structures. All will have headquarters at Jersey City, N.J.

Harold W. Manning, recently promoted to assistant division engineer of the Maryland division of the Pennsylvania, with headquarters at Baltimore, Md., as noted in the March issue, was born on July 26, 1902, at Newport, Pa., and attended Pennsylvania State College, graduating in civil engineering in 1925. He entered the service of the Pennsylvania on April 8, 1927, as assistant on the engineering corps of the Middle division, and was promoted to assistant supervisor of track the following year, in which capacity he served on the Delmarva and the New York divisions. He was appointed supervisor of track on the Long Island in 1929, being located at Hicksville, N.Y., and returned to the Pennsylvania, at Atlantic City, N.J., in 1931. Subsequently, he served as supervisor at London, Ohio, Colehour, Ill., Johnstown, Pa., Enola, Pa., and Dennison, Ohio, and was holding the last-named assignment at the time of his recent promotion.

C. H. Kooser, whose promotion to assistant division engineer of the Philadelphia Terminal division of the Pennsylvania, at Philadelphia, Pa., was noted in the April issue, was born at Manor, Pa., and received a B.S. degree in civil engineering from the University of Pittsburgh in 1926. He first entered the service of the Pennsylvania as a clerk in the station department in 1918 and later served as laborer, assistant signalman and crane fireman while completing his education. He became an engineer apprentice on June 7, 1926, and was advanced to assistant supervisor of track on January 1, 1928, in which capacity he served at Buffalo, N.Y., and Trafford, Pa. Mr. Kooser was promoted to supervisor of track at Monongahela City, Pa., on July 1, 1927, and later served at Niles, Ohio, and Cambridge. Between April 1, 1934, and February 1, 1938, Mr. Kooser was assigned to a number of special projects in connection with the Pennsylvania's electrification program and subsequently was in charge of the operation of the Sperry Car over the system. He became supervisor of track at Northumberland, Pa., on July 1, 1943, and was transferred to Mansfield, Ohio, on March 16, 1945, where he remained until his recent promotion.

L. W. Howard, supervisor of track on the Illinois Central at Corinth, Miss., has been promoted to division engineer at Jackson, Tenn., succeeding **E. F. Snyder,** who has been transferred to Champaign, Ill., to succeed **W. R. Gillam,** whose death is reported elsewhere in these columns.

Track

N. Dee Helton, extra gang foreman on the Southern, has been promoted to track supervisor at Somerset, Ky., succeeding **J. B. Hutcherson,** whose transfer to Dayton, Tenn., was announced in the May issue.

R. C. Sharpe and **H. L. Mills,** acting roadmasters on the Atlantic Coast Line, with headquarters at Jesup, Ga., and Thomasville, Ga., have been appointed roadmasters, with the same headquarters, effective May 1.

The headquarters of **R. L. Peters,** roadmaster on the St. Louis-San Francisco, has been changed from Chaffee, Mo., to Kennett, Mo.

I. L. Yoder, section foreman on the Atchison, Topeka & Santa Fe at Mayfield, Kan., has been promoted to assistant roadmaster, with headquarters at Wellington, Kan.

J. D. Bromley, assistant roadmaster on the Montreal Terminals division of the Canadian Pacific, with headquarters at Montreal, Que., has been promoted to roadmaster of the Ottawa Terminals, at Ottawa, Ont., succeeding **A. G. Hibbard,** whose promotion to division engineer, at Montreal, was announced in the May issue.

Lewis H. Rose, whose promotion to track supervisor on the Delaware & Hudson, at Whitehall, N. Y., was announced in the March issue, was born at Oneonta, N. Y., on May 26, 1911. He graduated in civil engineering from Clarkson College of Technology in 1935. He entered the service of the D. & H. in March, 1942, as a chainman and was advanced to rodman in April of 1943. He was furloughed for military service from March, 1944, until March, 1946. Mr. Rose was promoted to transitman in January, 1947, and was further advanced to assistant engineer in July of that year, the position he held at the time of his recent promotion.

Albert F. Brandon, whose appointment as track supervisor on the Southern at South Clarksdale, Va., was reported in the May issue, was born in Halifax County, Va., on September 13, 1901, and began his service with the Southern in February, 1922, as a laborer at Milton, N.C., later serving as apprentice track foreman at that location. He became section foreman at Holland, Va., in February, 1925, and served in that capacity until February, 1942, when he was furloughed for military service. He returned to the Southern as section foreman at Franklin, Va., in April, 1943, transferring in the same capacity to Semora, N.C., in April, 1945, and to South Hill, Va., in December, 1948, where he was located at the time of his recent promotion.

N. J. Padula, assistant supervisor of track on the New York division of the Pennsylvania, at Jersey City, N. J., has been promoted to supervisor of track on the Panhandle division, at Carnegie, Pa., where he succeeds **L. P. J. Bonfardin,** who has been transferred to Columbia, Pa., on the Philadelphia division. Mr. Bonfardin replaces **W. H. Shoemaker,** who has been transferred to Valparaiso, Ind., succeeding **Charles Weiss** whose promotion to assistant engineer, at Chicago, is noted elsewhere in these columns. **D. C. Avoletta,** general foreman on the New York division, has been promoted to assistant supervisor of track at Trenton, N. J., succeeding **R. L. McMurtrie,** who has been transferred to Jersey City to replace Mr. Padula. These changes were effective on May 1.

(Please turn to page 602)

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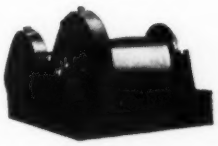

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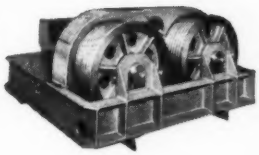

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Railway Personnel (Cont'd)

H. C. Alford, assistant roadmaster on the Seaboard Air Line, with headquarters at Henderson, N. C., has been promoted to roadmaster at Monroe, N. C., succeeding **R. L. Griffin,** who has been transferred to Hamlet, N. C.

P. A. Denson, section foreman on the Illinois Central at Grenada, Miss., has been promoted to supervisor of track, with headquarters at Moorhead, Miss., succeeding **D. T. Hester,** who has been transferred to Greenville, Miss., to succeed **M. A. Youngblood,** deceased.

V. W. Phillips, assistant roadmaster on the Norfolk & Western, with headquarters at Bluefield, W. Va., has been promoted to roadmaster at that point, succeeding **M. D. Farley,** who retired on March 16. **J. S. Bradshaw,** assistant roadmaster at Norfolk, Va., has been transferred to Williamson, W. Va., to succeed **R. E. Barnett,** who, in turn, has been transferred to Bluefield to replace Mr. Phillips.

W. E. Free, division engineer maintenance of way of the Atlantic Coast Line, with headquarters at Jacksonville, Fla., has been appointed roadmaster at Albany, Ga., succeeding **C. E. Vick,** who has been appointed engineer maintenance of way of the Charleston & Western Carolina, as noted elsewhere in these columns. **E. L. Anderson,** acting roadmaster at Lakeland, Fla., has been appointed roadmaster at that point, following the retirement, on April 1, of **F. C. Chandler.**

W. F. Stewart, section foreman on the Illinois Central at Ridgeland, Ky., has been prompted to track supervisor, with headquarters at Mendenhall, Miss., succeeding **N. R. Forbes,** who has been transferred to McComb, Miss., to replace **J. E. Rogan,** who has been appointed track supervisor at Corinth, Miss., succeeding **L. W. Howard,** whose promotion to division engineer is announced elsewhere in these columns.

Peter DiPaola, assistant supervisor of the Pittsburgh division of the Pennsylvania, with headquarters at East Liberty, Pa., has been promoted to supervisor of track on the Cincinnati division at Anderson, Ind., where he succeeds **R. V. Young,** who has been transferred to Greenville, Ill., on the St. Louis division, to succeed **W. R. Dunn,** who, in turn, has been transferred to the Maryland division, at Perryville, Md., to succeed **P. S. Settle,** whose promotion to assistant division engineer is noted elsewhere in these columns. **H. A. Markert,** general foreman track of the Renovo division, has been promoted to supervisor of track on the Buffalo division, with headquarters at Mt. Morris, N. Y., where he succeeds **G. D. Markert,** his brother, who died recently. **J. H. Nolf, Jr.,** general foreman—track on the Eastern division, has been promoted to assistant supervisor on the Pittsburgh division, with headquarters at East Liberty, Pa., succeeding Mr. DiPaola.

William C. McCormick, whose promotion to general roadmaster on the Seaboard Air Line, with headquarters at Savannah, Ga., was announced in the March issue, was born on December 2, 1906, at Starke, Fla. He entered the service of the Seaboard on March 16, 1925, as a section laborer on the Florida division and became apprentice section foreman the following month. He was advanced to foreman on December 17 of that year and was further promoted to assistant roadmaster at Hamlet, N. C., on July 1, 1937, where he remained until February 15, 1938, when he became roadmaster at Savannah. Between October 27, 1943, and May 30, 1946, Mr. McCormick served in the Army as a captain in the Transportation Corps, being assigned to the Military Railway Service in Europe. On being released from the Army, he returned to Savannah as roadmaster, remaining until the time of his recent promotion.

W. O. Smith, Jr., roadmaster of the Norfolk & Western at Wilcoe, W. Va., has been appointed roadmaster at Iaeger, W. Va., to succeed **W. O. Tracy, Jr.,** whose promotion to assistant superintendent of the Radford division is noted elsewhere in these columns. **R. E. Barnett,** assistant roadmaster at Bluefield, W. Va., succeeds Mr. Smith as roadmaster at Wilcoe. Mr. Smith entered the service of the N. & W. in 1934 in the general storehouse at Roanoke. After several promotions, he became assistant roadmaster on the line's Radford division in 1941. He later served in the same capacity in the road's Roanoke Terminal and on the Cincinnati district, subsequently advancing to the position of roadmaster at Wilcoe. Mr. Barnett joined the N. & W. as a timekeeper at Radford in 1935. After military service he returned to the railroad as inspector, office of the manager of railway maintenance in 1946, later being advanced to the position which he held at the time of his recent appointment.

Bridge and Building

Peter Campbell, bridge and building master of the Winnipeg Terminal division of the Canadian National, has retired after 34 years of service.

Stanford W. Gwin, assistant supervisor of bridges and buildings of the Knoxville division of the Southern, at Knoxville, Tenn., has been promoted to supervisor of bridges and buildings of the Appalachia division, with headquarters at Bristol, Va.

Luther Curtis, chief scale inspector on the Texas & Pacific at Dallas, Tex., has been promoted to superintendent of scales, with headquarters at Marshall, Tex., succeeding **Walter L. Ison,** who has retired after 30 years' service.

O. P. Nicely has been appointed assistant supervisor of bridges and buildings of the Clifton Forge division of the Chesapeake & Ohio, with headquarters at Clifton Forge, Va., succeeding **W. A. Hutcheson,** promoted.

E. C. Shuler, bridge and building inspector on the Syracuse division of the New York Central, at Rochester, N. Y., has been promoted to assistant supervisor of bridges and buildings of the St. Lawrence division, at Malone, N. Y., succeeding **Charles L. Lowell,** who retired on April 30.

Obituary

W. R. Gillam, division engineer on the Illinois Central, with headquarters at Champaign, Ill., died recently.

James J. Gallagher, engineer, maintenance of way, of the Missouri-Kansas-Texas Lines, at Dallas, Tex., died on April 29 in that city, following a heart

James J. Gallagher

attack. Mr. Gallagher, who was a native of Lamar, Mo., entered Katy service as an instrumentman in the engineering department at Parsons, Kan., immediately after graduation from the University of Missouri in 1919. He was subsequently advanced to assistant engineer at Parsons and was later transferred to Muskogee, Okla. He served as roadmaster at Wichita Falls, Tex., Denison, Smithville and Boonville, Mo., from 1921 to 1928, when he was appointed general foreman at Dallas. The next year he returned to Smithville as district engineer, being transferred to Denison in 1931. In October, 1936, Mr. Gallagher was promoted to superintendent at Denison and in March, 1944, became engineer, maintenance of way at Dallas.

J. R. Altizer, assistant superintendent of the Radford division of the Norfolk & Western, with headquarters at Roanoke, Va., died on April 27 at his home, following a heart attack.

Charles A. Morse, who retired in 1928 as chief engineer of the Chicago, Rock Island & Pacific and who was a past-president of the American Railway Engineering Association, died at Los Angeles, Cal., on April 12, at the age of 90. He had served with the R. I. for 15 years and with the Atchison, Topeka & Santa Fe for 27 years. He was also a past-president of the Western Society of Engineers and the Chicago Engineers Club.

(*Please turn to page* 604)

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Association News

Track Supply Association; B.&B. Supply Men's Association

A joint meeting of the Boards of Directors of the Track Supply Association and the Bridge and Building Supply Men's Association was held at Chicago on May 12 to formulate plans for cooperation with the Roadmasters' Association and the American Railway Bridge and Building Association during their concurrent annual conventions to be held September 12-14. A feature of the cooperation to be extended is a banquet which will be tendered by the two supply associations to the members of both the Roadmasters' Associations and the Bridge and Building Association on the evening of September 13. It is expected that this event will be attended by at least 800 persons.

American Railway Engineering Association

By action of the Board of Direction, E. M. Hastings, chief engineer, Richmond, Fredericksburg & Potomac, and a past president of the association, has been elected an honorary member. With Mr. Hastings' name added to the roster of honorary members there were eight such members, but the number has since been reduced to seven by the death on April 12 of Charles A. Morse, retired chief engineer of the Chicago, Rock Island & Pacific, and a past president of the association.

Six technical committees have scheduled meetings to be held during June, as follows: Ties, on June 7 and 8 at Wellington, Kan., and Kansas City, Mo.; Yards and Terminals, June 14 and 15, Congress Hotel, Chicago; Highways, June 15, association headquarters, Chicago; Waterproofing, June 21, association headquarters, Chicago; Economics of Railway Location and Operation, June 21 and 22, at Buffalo, N.Y.; and Records and Accounts, June 22 and 23, Montreal, Que.

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 12-14, 1949, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 14-16, 1950, Chicago. W. S. Lacher, secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—H. L. Dawson, secretary-treasurer, 1429 Eye street, N.W., Washington 5, D.C.

Bridge and Building Supply Men's Association—E. C. Gunther, secretary, 122 S. Michigan avenue, Chicago 3.

Maintenance of Way Club of Chicago—Next meeting, October 24, 1949. E. C. Patterson, secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Walter L. Turner, Jr., secretary, 30 Church street, New York.

National Railway Appliance Association—R. B. Fisher, secretary, 1 No. LaSalle street, Chicago 4.

Railway Tie Association—Annual convention, September 12-14, 1949, Peabody Hotel, Memphis, Tenn. Roy M. Edmonds, secretary-treasurer, 610 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 12-14, 1949, Hotel Stevens, Chicago. Elise LaChance, secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, secretary, 59 E. Van Buren street, Chicago 5.

Roadmasters' Association

The technical committees of the association are now at work on their reports with the objective of having them completed in time to be read and considered at a meeting of the Executive committee to be held at the Chicago Engineers' Club on Monday, July 11, which meeting will be attended by the committee chairmen as well as members of the Executive committee. Other business on the agenda of this meeting will include the making of final arrangements for the annual convention to be held at the Stevens Hotel, Chicago, on September 12-14. As in recent years the convention will be held concurrently with that of the American Railway Bridge and Building Association. It is planned to have at least two joint sessions of the two groups to hear addresses of common interest. Another joint feature will be the annual banquet, to be held on Tuesday, September 13, which will be sponsored for the benefit of the two groups by the Track Supply Association and the Bridge and Building Supply Men's Association.

Metropolitan Maintenance of Way Club

J. B. Bell, engineer of track, New York, New Haven & Hartford, was elected president of the Metropolitan Maintenance of Way Club at the annual meeting held on April 28 at the Skyline room of the Hotel Shelburne, New York. E. F. Shelley, track supervisor, Central Railroad of New Jersey, was elected vice-president, and E. L. Wilson, supervisor of track, New York Central, was elected second vice-president. Walter L. Turner, Jr., eastern editor, *Railway Engineering and Maintenance*, was elected secretary-treasurer. The next meeting of the club will be the annual outing, which will be held on Thursday, June 16, at the Out O' Bounds Aero and Golf Club, Suffern, N.Y.

B.&B. Association

The efforts of the association are now mainly directed towards the completion of plans for the convention to be held in Chicago, September 12-14. Work is well along on the committee reports, and the Executive committee plans to hold a meeting at the Chicago Engineers' Club on July 18 to review the reports and to make final arrangements for the program of the convention which, as in recent years, will be held concurrently with, but independent of, that of the Roadmasters' Association. Features of the convention will include at least two joint sessions with the Roadmasters' group and a banquet on September 13 for members of the two associations, which will be sponsored jointly by the Track Supply Association and the Bridge and Building Supply Men's Association.

Supply Trade News

General

The **Harnischfeger Corporation** has announced the opening of a new warehouse and offices at Teterboro, N.J. It is anticipated that the new warehouse, where a large inventory of equipment will be maintained, will provide faster service to eastern customers.

The **White Manufacturing Company,** Elkhart, Ind., has appointed the following sales representatives for its railway switch heaters: **John A. Roche,** 80 East Jackson boulevard, Chicago; **C. D. Hicks & Co.,** 7908 Bonhomme Avenue, Clayton (St. Louis) 5, Mo.; and **William H. Ziegler Company, Inc.,** 2929 University avenue, Minneapolis, Minn. The latter two companies will also handle other products of White manufacturing.

Personal

John D. Riley, district sales engineer of the **Link-Belt Company** at Boston, Mass., has been appointed district manager at Newark, N.J., succeeding the late **George E. Ramsden.**

Ralph C. Glacel, assistant to the traffic manager of the railway traffic and sales department of the **Texas Company,** at New York, has been promoted to assistant traffic manager, and **Herbert Adams,** chief clerk, has been promoted to assistant traffic manager, succeeding Mr. Glacel.

The **Black & Decker Manufacturing Company** has announced the removal of its service station at Indianapolis, Ind., to a new location at 1125 West 16th street. The service station, which also has a showroom displaying a large range of the company's tools, will be in charge of **J. T. Redmon,** service engineer, and **M. D. Mooers,** sales engineer.

Gilfry Ward has been appointed vice-president in charge of sales of the **American Manganese Steel Division** of the **American Brake Shoe Company,** with headquarters at Chicago Heights, Ill. A graduate of Yale university, Mr. Ward has been with Brake Shoe since 1928, and has spent many years on both the east and west coasts with the Amsco sale organization.

(*Please turn to page* 606)

Supply Trade News (Cont'd)

John R. Thompson, western district sales manager, transportation papers, of the **Simmons-Boardman Publishing Corporation,** at Chicago, has been elected vice-president of the corporation, with the same headquarters. He has also been appointed business manager of *Railway Engineering and Maintenance,* succeeding S. Wayne Hickey, a vice-president of the corporation, in overall charge of all advertising sales, S.-B. transportation publications, whose principal headquarters are now in New York.

Mr. Thompson, who was born on July 23, 1900, and educated at the University

John R. Thompson

of Toronto, has devoted his entire business career to the newspaper and business publishing fields. Immediately upon leaving college in 1918 he became assistant financial editor of the Toronto Globe, with headquarters at Toronto, Ont., and from 1920 to 1923 he was a junior account executive in the advertising agency of A. McKim Ltd., at Toronto. The following year he became advertising manager of Consolidated Press, at Toronto. In 1925 Mr. Thompson went with the Maclean-Hunter Publishing Corporation and for 13 years was manager of its Chicago office. During the next three years he was advertising manager of Maclean's magazine, with headquarters at Toronto, and in 1940 he returned to Chicago as vice-president and treasurer of the corporation in full charge of the publishing activities of its business journals (Inland Printer, Chemical Industries, Rock Products) in the United States. He joined the staff of Simmons-Boardman on September 1, 1948.

Allan Craig, sales manager of the southeastern division of the **Link-Belt Company,** with headquarters at Atlanta, Ga., has been promoted to general manager of the southwestern division at Houston, Tex. **Michael J. Perry,** district manager at Moline, Ill., succeeds Mr. Craig, and **Andrew K. Kolar,** district sales engineer at Moline, has been promoted to district manager in place of Mr. Perry.

(*Please turn to page* 608)

Supply Trade News (Cont'd)

Poor & Co., Chicago, has announced the election as vice-presidents of **E. A. Condit**, president of the Rail Joint Company, New York and **Max K. Ruppert**, president of the P. & M. Co., Chicago.

James W. Hepburn has been appointed assistant manager of the vertical pump division of the **Worthington Pump & Machinery Corp.**, with headquarters at Denver, Colo.

Clarence B. Randall, vice-president and a director of the **Inland Steel Company** at Chicago, was elected president at the annual meeting of directors on

Clarence B. Randall

April 27, succeeding **Wilfred Sykes**, who will continue with the company as a director and chairman of the executive committee. Mr. Randall was born on March 5, 1891, at Newark Valley, N. Y., and was graduated from Harvard University in 1912, and from the Harvard Law School in 1915. During World War I he served in the army as an infantry captain. He was admitted to the Michigan bar in 1915, and subsequently practiced law at Ishpeming, Mich., until August, 1925, when he joined the Inland Steel Company at Chicago, as assistant vice-president in charge of raw materials. He was elected vice-president in 1930 and also a director in 1935, which positions he held at the time of his recent election as president.

Mr. Sykes, who pioneered the development of electrical equipment for steel mills, was born at Palmerston, North New Zealand, on December 9, 1883. He was educated at Melbourne (Australia) Technical College and Melbourne University, and began his business career in 1901 as an engineer for the Allegemeine Elektricitats Gesellschaft, serving first in Australia and later at Berlin, Germany. In 1909 he came to the United States to become an engineer for the Westinghouse Electric & Manufacturing Co. He was appointed executive engineer for the Steel & Tube Company of America in 1920, and three years later joined Inland Steel. Mr. Sykes was subsequently advanced through various positions until he became president, the post he held at the time he retired.

(Please turn to page 612)

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

Products Index

Supply Trade News (Cont'd)

Harold G. Garner, paving engineer for the **Portland Cement Association** in the Topeka (Kan.) area, has been appointed district engineer at the association's Omaha (Neb.) office, succeeding the late **C. W. Hiner.**

In reporting in the April issue the appointment of **John H. Dooling** to the Tie Pad division of **Bird & Son,** East Walpole, Mass., it was erroneously stated that Mr. Dooling was a retired supervisor of track. Mr. Dooling resigned as supervisor of track of the Fitchburg division of the Boston & Maine in 1926, to become a representative of the American Fork & Hoe Co. in the railway field. During the war he was engaged in engineering work for the United States Government, and more recently has been associated with the Morrison Railway Supply Corporation as a representative on railroad products.

The **Le Roi Company,** Milwaukee, Wis., has announced the following personnel changes in its sales department: **Thomas V. Shea** has been appointed general sales manager; **J. E. Heuser,** industrial engine sales manager; **E. F. H. Dutton,** eastern district manager, and **Clyde R. Schuler,** sales engineer for industrial engines. In his new capacity, Mr. Shea will draw upon three years' experience as eastern district manager for Le Roi, and several years with other construction equipment manufacturers. Mr. Heuser, who has for many years worked in original equipment manufacturer and distributor sales, will be placed in charge of all industrial engine sales. Mr. Dutton represented Le Roi in the foreign sales department, formerly managed the Canadian plant of the Holman Company, Ltd. Mr. Schuler was formerly connected with the Hercules Motor Company for 20 years. He will handle Le Roi engine sales to equipment manufacturers in the Michigan-Ohio area.

John W. Humphrey, executive vice-president of the **Philip Carey Manufacturing Company,** Cincinnati, Ohio, has been elected president, succeeding **Robert S. King,** who has been appointed chairman of the board to succeed **George A. Rentschler.** Mr. Rentschler will continue to serve as chairman of the executive committee. **L. W. Clarke,** general sales manager, has been elected vice-president in charge of sales, succeeding **E. W. Smith,** who has resigned.

Obituary

C. Neal Barney, vice-president, secretary and general counsel of Worthington Pump & Machinery Corp., died at his home in Scarsdale, N. Y., on April 24, at the age of 73.

C. W. Hiner, district engineer of the Portland Cement Association at Omaha, Neb., for the past eight years, died recently at his home in Lincoln, Neb.

Harry W. Protzeller, consulting engineer, Railway Ballast Engineers, Inc., Milwaukee, Wis., who death was reported in the May issue, was born at Hokendauqua, Pa., in 1886, and received his higher education at Lehigh university. He began his business career with the Thomas Iron Company of Hokendauqua, and later spent two years with the Ironton Railroad. He subsequently became connected with the General Electric Company, where he served as special developing engineer. In July, 1923, Mr. Protzeller joined the O. F. Jordan Company, East Chicago, Ind., as development and special sales engineer, and later went with Fairmont Railway Motors, Inc., Fairmont, Minn., as development engineer. He left Fairmont to become associated with A. W. Nelson in research and development work on the transportation of perishable foods. In 1944 Mr. Protzeller joined the Nordberg Manufacturing Company, and four years later he participated in the organization of Railway Ballast Engineers, Inc., acting as consulting engineer for the company until his death.

(Please turn to page 614)

Trade Publications

(To obtain copies of any of the publications mentioned in this column, use postcards, page 609)

Rent from Foster—The L. B. Foster Company has published a four-page, two-color bulletin featuring the Foster piling rental service. It lists the advantages of the rental service, outlines how the service is conducted, and lists all the Foster products available.

Gas Welding Supplies—The Air Reduction Sales Company has published a 16-page catalog on gas welding supplies. Indexed for ready reference, the new catalog, the first of a projected series of 10, describes 19 different gas welding rods and 8 different fluxes, and includes a section on silver-brazing alloys. It also includes a page devoted to carbon rods and carbon plates.

Four-Wheel Drive Is Here—This is the title of a new piece of literature, published by the Frank G. Hough Company, presenting design details and specifications of the Hough Model HM Payloader. It contains numerous action views of the unit, which feature the positive action of the four-wheel pneumatic tire traction under severe job conditions.

Lorains on the Railroads—This is the title of a new eight-page, two-color booklet published by the Thew Shovel Company. The booklet presents data on crawler and on single and two-engine rubber-tired units, both in various sizes, and also on many types of front-end equipment, such as cranes, clamshells, draglines, shovels and magnets. The booklet is profusely illustrated with photographs of Lorain units in operation on railroads throughout the country.

Flame-Seal—The Stallton Chemical Corporation has issued a four-page two-color bulletin on the properties and application of its new product, a fire-retardant paint, called Flame-Seal, which is said to be moisture proof, termite proof and non-toxic as well as fire resistant.

Portite—This is the title of a four-page illustrated folder published by Hooper Products, Inc., listing 14 advantages of Portite, a concrete admixture produced by this company. Among the advantages described are control of air entrainment, improved workability at low slump, reduction of shrinkage, increased compressive strength and the prevention of honeycombs.

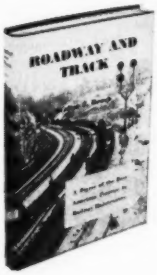
How Steel Is Made—The Inland Steel Company has published a 64-page booklet, liberally illustrated with sketches, diagrams and photographs, describing the many phases of steel production—from the mining of the raw materials to the finished product. Written in non-technical language, interesting and intelligible, yet authentic and comprehensive, the booklet is intended primarily for the layman—executives who buy and use steel, those engaged in steel fabrication, engineering students and others to whom steel making is of interest.

With Supplement Bringing Information Up to July, 1948

ROADWAY AND TRACK

By WALTER F. RENCH

Formerly Supervisor on the Pennsylvania



Use of the latest mechanical equipment in roadway and track maintenance is clearly described and pictured. Older methods employed where full mechanical equipment is not available are also explained. Most of the methods described are those in use on the *Pennsylvania* but A.R.E.A. recommended practices and those in use on other well maintained roads are included. The economics resulting from the adoption of modern methods are clearly outlined.

While written primarily for track supervisors and other maintenance officers, the new edition contains material of interest to transportation and mechanical officers who require a working knowledge of fundamentals of track work. Section and extra gang foremen who wish to acquire a working knowledge of their work will find it in this book.

Contents

ROADWAY: Essential Elements in Roadway Maintenance—The Right of Way—Drainage of Roadbed and Track—Vegetation for Banks—Economics of Roadway Machines—Labor Saving Methods and Devices in Roadway Work—Small Tools and Their Uses. TRACK: Essential Elements in Maintenance of Track—Program for Maintenance of Way and Structures Work—The Track Obstruction—Power Machines and Equipment—Labor Saving Methods in Track Work—Track Materials and Their Uses—Practice in Rail Renewals—Practice in Rail Repair and Inspection—Maintenance of Main Tracks—Maintenance of Yards and Terminals.

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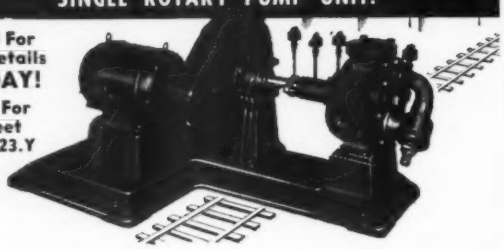

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Assures an adequate supply of cool, pure drinking water for maintenance crews, section hands, locomotive engineers. Protects their health and keeps them on the job. Fountain has inner water container of stainless steel. Four gallon tank is fully insulated. Constant air pressure for instant flow of water is furnished by a few strokes of the pump at widely spaced intervals. Operates *at the press of a button*, like any bubbler drinking fountain. May be carried easily from place to place by shoulder strap, or mounted on truck, tractor or locomotive. Prices on request.

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ALPHABETICAL INDEX TO ADVERTISERS, JUNE, 1949

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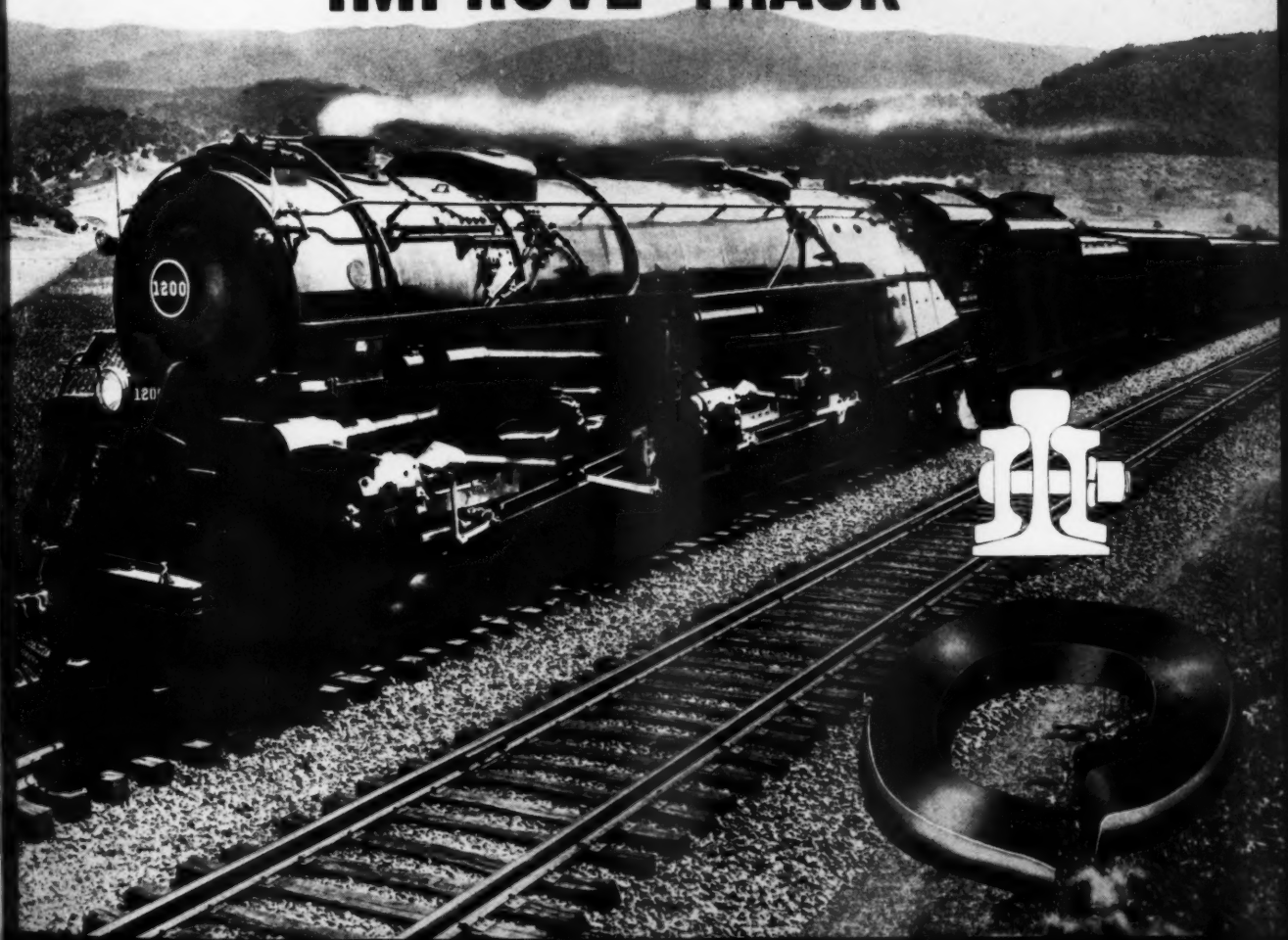

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